FROM
PREEMPTIVE TIGHTENING
TO
PREEMPTIVE EASING

The Evolution of U.S. Monetary Doctrines and Practices in the Great Moderation

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Master Thesis in History
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Fall 2010

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Abbreviations

BIS	**Bank for International Settlements**
DIDMCA	**Depository Institutions Deregulation and Monetary Control Act**
Fed	**Federal Reserve System**
FOMC	**Federal Open Market Committee**
FRB	**Federal Reserve Board**
FSLIC	**Federal Savings and Loans Insurance Corporation**
IMF	**International Monetary Fund**
NAIRU	**Non-accelerating Inflation Rate of Unemployment**

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INTRODUCTION

When Alan Greenspan stepped down as Chairman of the Board of Governors of the Federal Reserve System (Fed) in early 2006, he was widely hailed as the world's most important and successful monetary policymaker.[1] He had resided over 19 years of low, stable inflation and robust growth, only interrupted by two relatively mild and short-lived recessions. Increasingly, market participants and politicians had put their faith in this one man, and his small band of monetary brothers at the Federal Open Market Committee—the main decision-making body of the Fed—to ensure the stability of the economy. Bob Woodward of the *Washington Post* dubbed him the "Maestro" in a best-selling biography.[2]

Convening at the annual Federal Reserve Bank of Kansas City symposium at Jackson Hole, Wyoming in late August 2005, central bankers and economists from around the world discussed the legacy of the soon departing chairman. Alan Blinder and Ricardo Reis, two prominent American macroeconomists, stated that Greenspan "has a legitimate claim to being the greatest central banker who ever lived. His performance as chairman of the Fed has been impressive, encompassing, and overwhelmingly beneficial—to the nation, to the institution, and to the practice of monetary policy."[3]

Central banking expert John B. Taylor concurred: "No matter what metric you use, the Greenspan era gets exceedingly high marks for economic performance." He pointed to the "price stability" and "economic stability" that had characterized the U.S. economy under the chairman's watch. Moreover, he stressed the *principled* way the Greenspan FOMC had conducted policy:

> "[M]onetary policy decisions under Alan Greenspan's leadership have been guided by a clear set of monetary policy principles. *Good judgment* and leadership have been essential to implementing these principles, but the principles are by no means a secret. These principles, along with their judicious implementation, are a major reason for the *extraordinary economic performance* during the Greenspan era."[4] (Emphasis added.)

The principles in question were those in line with his own "Taylor Rule," a set of guidelines for how central banks should make use of their main policy lever—the manipulation of some sort of short-term interest rate—in order to influence its main policy goals—the desired

[1] *Economist*, "Danger time for America" and "Monetary Myopia," January 12, 2006
[2] Bob Woodward, *Maestro: Greenspan's Fed and the American Boom*, Simon & Schuster, 2000
[3] Alan S. Blinder and Ricardo Reis, "Understanding the Greenspan Fed," *Kansas City Fed Symposium*, 2005, p. 13
[4] John B. Taylor, "Commentary: Understanding the Greenspan Fed," *Kansas City Fed Symposium*, 2005, p. 107-108

growth rate of inflation and output.[5] The Taylor framework is based on the observation that stable growth in average consumer prices was closely associated with economic stability during the Greenspan years. The operating "rule" was in fact an attempt to formalize the track record of the chairman, and could thus be seen as both *descriptive* of actual monetary policymaking as well as *prescriptive* of how policy should be conducted.[6]

Thus this "rule" points to major elements of the monetary *doctrines* that informed Fed *practices* during the Greenspan years. The overall consensus that emerged during this period was one of a "Great Moderation"—two decades of almost unprecedented macroeconomic stability—in part ascribed to the stabilizing influences of central bankers and their pursuit of "price stability."[7] Other core beliefs contributed to the emerging consensus as well, such as notions of a "natural" rate of unemployment, the role of expectations among market participants, and strong-held views on how central bankers should respond to large-scale fluctuations in asset prices. These core beliefs, how they evolved and in what ways they contributed to shape the practice of policy is the topic of this study. An investigation into the development of monetary policy during this period leads to the following question:

How did U.S. monetary doctrines and practices evolve during the Great Moderation, and which main factors contributed in shaping these developments?

To shed light on this important question, three central episodes of monetary practice will be given ample attention. The first episode culminated with the 1994 FOMC decision to prevent an upward tick in inflation, even though no such inflationary pressures were apparent in indicators of consumer price growth at the time these actions were taken. The second episode was FOMC decisions in the late 1990s on occasion to discontinue the practice of raising rates when indicators of strong growth and tight labor markets suggested the need to cool down the economy. The third episode was the 2003 FOMC decision to take out an "insurance policy" towards a potential, but unlikely, downside risk of deflation. Whereas the first episode involved an act of preemptive monetary tightening, the third episode represented the opposite, a move towards preemptive monetary easing. The second episode falls somewhere in between, and can be seen as a transitional step towards a new policy regime.

[5] John B. Taylor, "Discretion versus policy rules in practice," Carnegie-Rochester Conference Series on Public Policy 39, 1993, pp. 195-214

[6] As pointed out by Blinder and Reis: "But, of course, Taylor's original parameters were not intended to set a standard of fine-tuning. In fact, they were intended to capture the behavior of Alan Greenspan." Blinder and Reis, *Kansas City Fed Symposium*, 2005, pp. 33-34

[7] The *Economist* dubbed central bankers "heroes of the zeroes," alluding to the attainment of low and stable inflation during the Great Moderation. *Economist*, "Heroes of the Zeroes," October 18, 2007

The working hypothesis of the investigation at hand is that these episodes represent major shifts in U.S. monetary doctrines and practices—from a focus on *preemptive tightening*, in order to fully contain inflation, to an approach characterized by a systematic bias towards *preemptive easing* whenever certain "downside risks" appear on the horizon.

What caused this shift? During the early years of Greenspan's tenure, the fight against inflation was still not seen as perfectly secured. The wish to build reputational capital as credible inflation fighters was high on the list of priorities. However, as the Great Moderation became entrenched in the minds of policymakers and monetary economists, the gains were perceived as more permanently realized. At the same time, new challenges arose both within the domestic economy and stemming from abroad.

It will be argued that perceived threats was a main contributing factor to the development of the doctrines informing monetary practices of this period. The stance towards preemptive tightening was motivated by the lessons drawn from the Great Inflation of the 1970s and early 80s. However, during the 1990s and early 2000s, the familiar inflationary foe was gradually surpassed by two other major concerns of which the Fed had less experience—a fear of financial fallouts and a fear of deflation. Both emanated from observed real time events, notably a period of global financial turbulence and certain unsettling economic developments taking place in the world's second largest economy, Japan.

The Role of Ideas

This study starts off from one basic assumption, namely that ideas matter and that to understand the evolution of economic policy, one needs to investigate the core beliefs of the historical actors involved. This is not to say that external constraints do not matter—they do—but that in the final analysis no policies could ever be formulated if decision-makers do not possess some basic model of how the world works and formulate cogent thoughts on how policy instruments could be made use of to influence the goals aimed at.[8] One major argument developed through subsequent analysis and discussion is that U.S. monetary doctrines largely evolved in reaction to lessons drawn from historical experiences. The analysis emphasizes the intellectual response to these experiences among leading actors who

[8] Central banking researcher (and former practitioner) Alan Blinder makes a similar point in stressing that "some kind of model—however informal—is necessary to do policy, for otherwise how can you even begin to estimate the effects of changes in policy instruments?" Alan S. Blinder, *Central Banking in Theory and Practice*, MIT Press, 1999, p. 7

sought to refine and sometimes redefine models of the world they were trying to come to grips with.

Such a view highlights the role of ideas in economic decision-making and how they feed into the performance of modern economies. The British economist John Maynard Keynes famously wrote that the "ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else." He added that decision-makers engaged in practical politics are "usually the slaves of some defunct economist" and that those in authority are "distilling their frenzy from some academic scribbler of a few years back."[9]

In an anthology exploring how the ideas of Keynes gained influence in various industrial countries, Peter A. Hall outlines three different analytical approaches to investigating the development of economic doctrines and policy practices. The first one is "economist-centered" in that it analyzes this issue mainly as a problem of explaining how new ideas gain acceptance among members of the economics profession. In the present study, a chapter exploring the evolution of macroeconomic understanding will largely make use of such an approach. A second perspective is labeled "state-centered," and sees evolving doctrines as a way to solve the administrative puzzles associated with conducting policy.[10] This study can be seen as following such a strategy, which seems to correspond well with Greenspan's understanding of the policymaking process. Hall points out that how readily new ideas will be accepted in large part depends "on the way those ideas relate to the economic and political problems of the day."[11] Prominent Fed officials spent considerable time contemplating economic events unfolding around them, trying to make sense of the world. In response, new doctrines were formed and new monetary practices followed.

The third approach, which Hall labels "coalition-centered," embeds the analysis in a wider social context, giving attention to how politicians and voters influence the policy process. This context will largely be left aside, though it is important in its own right and should be a worthy pursuit for other studies. Monetary doctrines can be seen as strategies of policy formulation and communication within a democratic setting, finding ways to shield the central bank from external pressure, at the same time gaining recognition for its importance.

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[9] John Maynard Keynes, *The General Theory of Employment, Interest and Money*, Classic Books America, 2009 [originally published in 1936], p. 331
[10] Peter A. Hall (ed.), *The Political Power of Economic ideas: Keynesianism across Nations*, Princeton University Press, 1989, pp. 8-13
[11] Peter A. Hall, "Conclusion," in Peter A. Hall (ed.), *The Political Power*, 1989, p. 369

In approximating the second outlined approach, most attention will be given to doctrinal developments in light of policymakers' pursuit of a satisfactory framework for conducting policy, informed both by lessons learned from monetary experiences as well as from the emerging academic debate.

In the postwar years, Keynes would himself become one of those academic scribblers informing policymakers on how to conduct policy, more specifically policy aimed at stabilizing the economy on a macro level through the conduct of deliberate "aggregate demand management." The original policy levers envisioned for this government task was the discretionary use of taxing and spending decisions to influence the overall level of investment and consumption in the economy, thus ensuring a desired level of output and employment. Thus high hopes were placed on the shoulders of fiscal policymakers to smooth out economic fluctuations. Several governments in the industrial countries would design policies aimed at "governing the economy" based on Keynesian policy-prescriptions.[12] In the U.S., such policies were forcefully pursued by the Kennedy-Johnson administration (1961-69). Rather than delivering the promised stability and improved economic performance, postwar aggregate demand management ended up in a highly unstable episode of accelerating inflation, weak performance and widespread uncertainty, both to the policy regime as well as the general economic outlook.

The Great Inflation (c.1965-85) led to soul-searching among macroeconomists and profound revisions of economic policymaking. In the early 1980s, Fed Chairman Paul Volcker (1979-1987) sought to rein in monetary excesses. His successor Alan Greenspan (1987-2006) seemed determined to finish the job.[13] Inflation, depending on how it is measured, was somewhere around 4 percent during the first year of Greenspan's chairmanship, 3 percent a decade later, and just above 2 percent at the time of his departure in 2006.[14] Having finally caged the "inflation dragon," other issues entered policy discussions at the Fed.[15] Greenspan would develop a new style of policymaking, which he dubbed the Fed's "risk management paradigm." Such an approach stressed flexibility and the need to weigh potential threats against each other by assessing the potential damage should such developments come to pass.

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[12] Peter A. Hall, *Governing the Economy: The Politics of State Intervention in Britain and France*, Oxford University Press, 1986

[13] Richard Timberlake, *Monetary Policy in the United States: An Intellectual and Institutional History*, University of Chicago Press, 1993, pp. 390-91

[14] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 30

[15] "[D]uring the 1980s and 1990s most industrial-country central banks were able to cage, if not entirely tame, the inflation dragon. Although a number of factors converged to make this happy outcome possible, an essential element was the heightened understanding by central bankers and, equally as important, by political leaders and the public at large of the very high costs of allowing the economy to stray too far from price stability." Ben S. Bernanke, "Deflation: Making Sure 'It' Doesn't Happen Here," remarks before the National Economists Club, Washington, D.C., November 21, 2002

The Preemption Doctrine

The picture that emerges from this analysis is that monetary doctrines evolved from a predominant concern with inflation and monetary tightening to a concern with a wide range of threats, including incipient deflation and financial stress. The understanding of challenges emanating from domestic and global economic developments increasingly led the Fed to formulate a doctrine of preemptive easing—the idea that the monetary authorities should cut interest rates and inject liquidity into the banking system to stave off potential threats to the short-term stability of the economy, even before they turned into actual threats.

In some sense, monetary preemption could be seen as a corollary to the contemporaneous "Bush doctrine," the notion that U.S. authorities should nip potential security threats in the bud. Both doctrines would come to define crucial aspects of government interventions, one in the foreign political sphere the other in the domestic economic sphere.

The monetary preemption doctrine and the underlying set of assumptions it rested upon evolved in response to experiences with events taking place both domestically and in the global economy. Reflecting upon these developments in the late 1990s, Greenspan stated: "For monetary policy to foster maximum sustainable economic growth, it is useful to *preempt forces of imbalance* before they threaten economic stability." (Emphasis added.) Such a stance did not involve leaning against asset prices when stock markets were booming, or confronting other imbalances as they were building up, but rather to contain the fallout from financial distress, even before it materialized. Such a strategy would, it was hoped, minimize the costs to the economy: "When we can be preemptive we should be, because modest preemptive actions can obviate the need of more drastic actions at a later date that could destabilize the economy."[16]

These beliefs drew upon previous historical lessons. The pain of the Great Depression was attributed to policy mistakes in the wake of the Wall Street crash. In contrast, in 1987 Greenspan had contained a stock market collapse that left the economy largely unscarred. The conclusion was that the consequences of bubbles "need not be catastrophic for the economy"—that is, if the fallout is contained.[17]

[16] Alan Greenspan, "Monetary policy and the economic outlook," Testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999
[17] Greenspan, "Monetary policy and the economic outlook," 1999

Delineating the Period under Investigation

The period under investigation is delineated by the developments for monetary policymaking that emerged after the Great Inflation loosened its grip on the economy in the mid-80s and up to the Great Panic and Recession that erupted towards the end of the 2000s. The roughly two decades in between could, in line with economist Hyman Minsky, perhaps be described as a "period of tranquility," in which macroeconomic volatility substantially subsided and inflation trended downwards to its lowest level in close to a generation.[18] However, at closer inspection, there were several troubling signs surfacing, especially in the latter part of this period. These two decades largely coincide with Greenspan's tenure as Fed chairman, and could be referred to as the "Greenspan era" (1987-2006).[19]

After exploring the implications of the Great Moderation and the fight against inflation, the investigation will focus in on the latter part of the Greenspan years, when a new direction to monetary practices became increasingly apparent—a period that could perhaps, in following the former Fed Chairman, be labeled the "Age of Turbulence."[20] From 1997, monetary policymakers were faced with a whole new set of challenges, most of which were related to developments taking place in domestic and global financial markets.

A taste of things to come was Greenspan's baptism of fire, the "Black Monday" stock market crash of October 1987, only a few weeks after he took office. This episode suggested the dangers of what could happen when domestic asset markets underwent unsustainable booms, necessitating a substantial market correction. It also suggested that determined monetary policymakers could contain the fallout of financial distress by rapid injections of liquidity and assurances "to support the economic and financial system."[21]

To return to the Bush preemption doctrine analogy, not unlike the first Gulf War, it would seem that the perceived success of determined government intervention gave rise to more ambitious approaches to policy. As with operation "Desert Storm," the Fed's rescue operation in 1987 would not materialize in a consistent set of practices until a decade later, when policymakers were faced with a new set of perceived threats to their overarching goal of stability—be it geopolitically or economically.

As with national security issues, in the economic sphere several of these threats were identified abroad. An early warning sign was the "Tequila" crisis of 1994, when stress in the

[18] Hyman P. Minsky, *Stabilizing an Unstable Economy*, McGraw Hill, 2008, p. 197
[19] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 12
[20] Alan Greenspan, *The Age of Turbulence: Adventures in a New World*, Penguin Press, 2007
[21] Public statement by the Fed, quoted in Greenspan, *Age of Turbulence*, 2007, p. 108

market for Mexican government debt nearly led to sovereign default. The U.S. government, acting with the Fed in an advisory role, intervened, creating a precedent for large-scale bailouts that would weigh heavily in subsequent global financial developments. Moral hazard seems to have played its part when U.S. and European banks deemed it safe to lend substantial amounts of short-term money to emerging markets in Asia. Similar assessments pertained to Russia, thought to be "too nuclear too fail."[22] The Mexican crisis was thus a forerunner to the much more destabilizing and contagious Asian crisis of 1997-98, setting off a wave of currency crises and defaults around the world, finally coming to an end with the Brazilian and Argentinean crises at the turn of the century. In the words of Greenspan, the Asian crisis, and especially the Russian default, was a "rude awakening."[23]

Other threats loomed on the horizon as well. A Y2K scare caused some concern, as many people came to believe that computer systems worldwide could crash, not being able to tune into the next millennium. Soon thereafter, one of the most dramatic financial busts in history happened inside the U.S. itself as equity markets plunged with the bursting of the dotcom bubble. Following on its heels, the terror attacks on the financial heart of the U.S.—the World Trade Center in New York City—created concerns that an already weakened economy could be pushed further into recession.

All of these considerations came together in the FOMC decision to preemptively ease policy by pushing down U.S. short-term money market rates to historical low levels and keep them there for an extended period of time during the first half of the 2000s.

Historiography

The period in question has been widely discussed and researched among macroeconomists working within academia, international policy institutions and at the Federal Reserve itself. Much attention has been directed to explaining the apparent stabilizing and beneficial developments taking place within the economy, associated with the Great Moderation. Parts of this literature will be treated as primary sources, that is, records of how those shaping the evolving consensus thought about the problems at hand and how this informed the emerging monetary practices.

[22] Robert Hetzel, *The Monetary Policy of the Federal Reserve: A History*, Cambridge University Press, 2008, pp. 206-215
[23] Alan Greenspan, "Monetary Policy and the Economic Outlook," Testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999

Few researchers have taken a bird's eye view, analyzing these intellectual developments from without, and the literature that does exist usually stops short at developments sometime in the 1990s. Robert Hetzel, a senior economist at the Research Department of the Richmond Fed, covers the history of U.S. monetary policy in the 20th century. He traces the "grand monetary experiment" of moving from a gold standard at the beginning of the century to pure fiat money at the end. In his assessment, pure paper money initially spurred a period of instability. Eventually a new "nominal anchor" was found in the "Volcker-Greenspan monetary standard," emerging in the 80s and early 90s.[24]

Hetzel contends that the "U.S. monetary standard has evolved pragmatically rather than by conscious design"—as a result of attempts by the Volcker and Greenspan FOMC to "reanchor inflationary expectations" and establish a policy framework free of the disturbing stop-go policies of the past. This consistent approach paid off in the form of increased central bank credibility and the restoration of the "expectational stability" ascribed to the gold standard.

The story does not end here. Hetzel hypothesizes that "Greenspan pursued price stability as a 'provisionally' desirable long-run objective until the Asia crisis."[25] After that, policy objectives changed. Actions undertaken in 1998 did, in his assessment, not point towards any intentions on the part of the FOMC to preserve price stability. As a result, inflation expectations moved significantly up and down.[26]

This analysis seems to imply that policy became more expansionary after 1997 because the FOMC was more concerned with other issues, related to episodes of financial distress. Moreover, inflation had at this point in time reached a low level. Hetzel's analysis of the development of Fed practices is colored by his specific set of theoretical lenses, those of monetarism. Thus in his assessment, the Fed failed on several accounts to push for "price stability," defined as zero inflation. He does not venture into a deeper investigation of the intellectual developments underpinning these policy shifts, nor scrutinize the theoretical case they rest upon.

Likewise, Richard Timberlake, a retired professor of economics and finance at the University of Georgia, sees the quest for price level stability as a "road not taken," thinking that the "FOMC's performance in the mid-1980s is an example of a golden opportunity not grasped."[27] He attempts at an encompassing intellectual and institutional history of U.S.

[24] Robert Hetzel, *Monetary Policy of the Federal Reserve: A History*, Cambridge University Press, 2008, p. 1
[25] Hetzel, *Monetary Policy*, 2008, p. 197
[26] Hetzel, *Monetary Policy*, 2008, p. 224
[27] Timberlake, *Monetary Policy*, 1993, p. 389

monetary policy from a monetarist perspective. He covers the 19th as well as 20th centuries, but barely enters into the period presently under investigation and only briefly discusses the role of price stabilization under Greenspan. Published in 1993, the book does not foresee the new directions that would emerge in response to concerns with financial instability or deflation in the decade to come.[28]

Writing from a New Keynesian (NK) perspective, macroeconomists Christina and David Romer have commented upon the "evolution of economic understanding and postwar stabilization policy," tracking developments from the 1950s till the end of the century. They start out from the hypothesis that stabilization policy, as practiced in the United States, underwent two major shifts in the postwar period. They attribute these shifts not to changing policy goals, but rather to changes in economic understanding. In their assessment, policy went off track during the Great Inflation, but was substantially improved during the Great Moderation due to a better understanding of how the economy works and what can realistically be achieved through the use of macroeconomic policy.

In contrast to Timberlake and Hetzel, telling a monetarist tale, the Romers see the evolution of stabilization policy as confirming the NK understanding as it formed during the Great Moderation. They write that the "end of the 1970s and the beginning of the 1980s saw the emergence of an important new consensus among policymakers about the functioning of the economy and the effects of policy."[29] This new consensus is largely in line with today's textbook model of the macro-economy, seen in light of the "natural-rate hypothesis," which rejects the notion of a trade-off between unemployment and inflation in the long run and which assesses the implied policy trade-off in the short run in more realistic terms.

One notable shortcoming of their analysis, from the perspective of this study, is that it was written *during* the period under investigation and *within* the perspective of those forming the consensus currently under investigation. However, this could of course also be a major strength, all depending on how this literature is made use of. Their analysis and the perspectives involved can inform later researchers on how major actors within the field of monetary policy debate, such as the Romers themselves, looked upon developments during this period, and which cues they took from history in formulating their own beliefs. Since exploring how specific lessons drawn from history contributed in shaping the policy regime is a major task of this investigation, their narrative is of great interest to understand how doctrines were formed.

[28] Timberlake, *Monetary Policy*, 1993
[29] Christina Romer and David Romer, "The Evolution of Economic Understanding and Postwar Stabilization Policy," *Kansas City Fed Symposium*, 2002, p. 33

The Romers hold that "[t]he central features of policy-makers beliefs have undergone remarkably little change over the past twenty years."[30] The present investigation attempts to cast this statement into doubt, instead arguing that policymakers' understandings have in fact undergone major changes, reflecting economic experiences and the lessons drawn during the Great Moderation. The Romers acknowledge the change in policy practices represented by actions to preempt inflation in the 1990s, but do not touch upon the issue of preemptive easing, which emerged more clearly in the early 2000s. Moreover, their overall assessment is one of continuity, thinking that policymaking had come "full circle" when comparing beliefs at the beginning and end of their period of investigation (1950-2000), interrupted by "an extended detour" during the Great Inflation.[31]

The scope of the Romer analysis is largely confined to the emerging views on unemployment, inflation and the efficacy of aggregate demand management in controlling both. They stress that "[m]onetary policymakers have remained passionate in their views of the harms of inflation."[32] What is largely left out of the picture, are the understandings among historical actors of other issues emerging in this period—issues that would have important implications for the conduct of monetary policy.

Writing from a somewhat more heterodox position, macroeconomist and former Fed Vice Chairman Alan Blinder, who could perhaps be labeled an "Old" Keynesian, offers some insights to these other issues. Along with co-author Ricardo Reis, he presents an interesting analysis of the "Greenspan standard," though their assessments at times seem a bit panegyric, as testified by the quote at the beginning of this chapter.[33] Blinder and Reis seem content that most policy actions were the right ones, leaving little scope for a critical review of the former chairman's track record.

It would seem that most writers as well as monetary policymakers were blindsided by the apparent stability of the Great Moderation, thus underplaying destabilizing forces that could emerge, upsetting the balance of the economy and policymaking within it. In the words of one influential researcher, New Keynesian Olivier Blanchard, the "great moderation lulled

[30] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 36
[31] "Despite these changes at the end of the century, the analysis of the narrative record for the postwar era fundamentally leaves one with the sense that policymakers' beliefs have almost come full circle. Both in the 1950s and in the 1980s and 1990s, the key features of policymakers' model of the economy were a realistic view of sustainable unemployment and a conviction that inflation was very costly." Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 39
[32] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 36
[33] They concede to "some possible negative aspects of the Greenspan legacy […] though not many," mainly questioning the "wisdom of a central bank head taking public positions on political issues unrelated to monetary policy" and whether the "extreme personalization of monetary policy under Greenspan has undercut his ability to pass any 'capital' on to his successor […]" Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 13

macroeconomists and policymakers alike in the belief that we knew how to conduct macroeconomic policy."[34] With the benefit of hindsight, as the Great Moderation came to a close with the dramatic events at the end of the 2000s, yesteryear's certainties do not appear that certain anymore. Thus, reassessing the doctrines of this period and the practices they informed, seen from without the consensus that prevailed at the time, seem like a worthwhile, not to say necessary, endeavor.

Primary Sources and Historical Actors

In order to assess the development of monetary doctrines and practices, an investigation into actual policy decisions will be accompanied by exploring sources that could hopefully reveal the underlying worldviews informing policymakers. In the words of Romer and Romer, "[p]olicymakers are often required (or simply desire) to explain the motivations of their policy actions."[35] A prime example is Greenspan, who on numerous occasions, including frequent testimonies before congressional committees, set out to explain his beliefs and the historical developments that contributed in shaping them. In a similar manner, his 2007 autobiography seems to be motivated by the desire to retrospectively explain his evolving worldview and the rationale behind FOMC decisions during his tenure as Fed Chairman.[36]

A usual drawback of such memoirs is that the understandings and beliefs of the actor in question could be colored by later developments. In the case of Greenspan, his accounts were formulated shortly after leaving office and before his "whole intellectual edifice" collapsed, in light of the financial crisis that erupted in 2007.[37] Hence the beliefs expressed are much in line with what he held at the time as chairman, though they are undoubtedly shaped by experiences during his long-lasted tenure and could thus be more representative of his understandings towards the end of this period.

Still, this source is useful in that it points to several key issues preoccupying the chairman as well as voting members of the Federal Open Market Committee during the period under investigation. The importance of these issues are confirmed by other studies and, more importantly, contemporaneous sources. Key sources in this regard are records of what was discussed at the time of decision-making as well as various statements of main actor's beliefs.

[34] Olivier Blanchard, Giovanni Dell'Ariccia, and Paolo Mauro (2010), "Rethinking Macroeconomic Policy," *IMF Staff Position Note*, International Monetary Fund, February 12
[35] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 15
[36] Alan Greenspan, *Age of Turbulence*, 2007
[37] During an October 2008 Congressional hearing on the causes of the financial crisis, Alan Greenspan exclaimed that the "whole intellectual edifice…collapsed in the summer of last year." Quoted in Steve Coll, "The Whole Intellectual Edifice," *New Yorker*, October 23, 2008

By analyzing the views of policymakers "about the economic conditions and relationships that warranted policy actions, it is often possible to get a sense of policymakers' understanding of the economy at the time decisions were made."[38]

Important sources in this regard are statements of the Fed Chairman before Congressional committees responsible for monetary oversight. These statements accompanied semi-annual monetary policy reports to Congress, mandated by the Humphrey-Hawkins act of 1978. The documents related to these reports and the hearings that surrounded them will thus be referred to as *Humphrey-Hawkins* in the subsequent analysis.

Policy decisions and discussions can be accessed in the written records of the Federal Open Market Committee (FOMC), published by the Federal Reserve Board (FRB). Key sources are the minutes of FOMC meetings, which provide a "summary of significant policy issues addressed by meeting participants" and record all FOMC decisions "with respect to these policy issues and explain the reasoning behind these decisions"—according to the stated intentions of the Federal Reserve Board.[39]

Before 1993, the minutes were published in two separate documents, the *Record of Policy Actions* and the *Minutes of Action*. From February 1993, the *Minutes* were usually published three days after the subsequent FOMC meeting. Starting in December 2004, this time lag was shortened to three weeks, thus being published in *advance* of the subsequent FOMC meeting. Transparency was given an additional push by publishing explicit statements of FOMC policy intentions at the close of each meeting. In February 1994, the FOMC made its first move towards announcing its key policy decisions. This procedure was formalized the year after; from now on "all changes in the stance of monetary policy would be immediately communicated to the public." A new breakthrough on the road to disclosure came in January 2000, when the committee announced "it would issue a statement following each scheduled meeting, regardless of whether there had been a change in monetary policy."[40]

These statements are helpful in analyzing the policy records, as they can point to key decisions and the main rationale behind them. Moreover, starting in May 1999, the FOMC consistently revealed its policy "bias" in its issued statements. In February 2000, the "bias" was replaced with a "balance of risks" sentence, "stating whether the FOMC was more concerned with 'heightened inflationary pressures' or 'economic weakness' (or neither) in

[38] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 15
[39] FRB, "Federal Open Market Committee: Transcripts and other historical material," http://www.federalreserve.gov/monetarypolicy/fomc_historical.htm
[40] FRB, "Federal Open Market Committee: Transcripts and other historical material"

'the foreseeable future.'"[41] In other words, the "balance of risks" statement refers to whether the FOMC was more concerned with the "upside" risk of inflation and overheating or the "downside" risk of too low inflation and a drop in activity.

Blinder and Reis cite May 1999 as "a watershed in the history of the Fed's reluctant peregrination toward transparency."[42] This direction would seem to be important for the efficacy and legitimacy of policy. Nonetheless, it brings with it some challenges in assessing the motivations of historical actors. Before initiating new disclosure practices, FOMC decisions were mired in secrecy. Monetary policymakers, relieved of potential public scrutiny in the aftermath of committee meetings, would likely have felt more free to express their concerns and opinions. As the FOMC has become more transparent, discussing the issues at hand is done in a context in which members must be prepared to defend their views against outside criticism. FOMC records could thus become less reliable as a source of the actors' underlying motivations and outlooks.

Supporting sources, though inhering the same shortcomings as the *Minutes*, are the full transcripts of FOMC meetings, which more closely show the verbatim arguments made by FOMC members during policy deliberation. These will be drawn upon when necessary. Policy records will be annotated *Minutes*, *Statement*, and *Transcript*. These citations will mostly figure in footnotes. (*Minutes* and *Statements* do not come with page numbering.)

Another set of indispensible sources is, of course, official statistics collected by the central bank. Most of the monetary data can be accessed through the FRED database of the Federal Reserve Bank of St. Louis (cited as St. Louis Fed, FRED). Relevant data include comprehensive time series on the monetary policy rate (the federal funds target rate), monetary aggregates (such as base money, M1, and M2), bond rates (such as the yield on government securities) and consumer prices (core and headline inflation).

These statistics show some of the underlying data policymakers make use of in assessing the state of the economy, as well as the trajectory of the main policy instrument, the fed funds rate. However, most attention will be directed at the narrative record, pointing to a wide range of actors influencing the policy process, either directly through policy prescriptions or indirectly by contributing to the beliefs of decision-makers. For the sake of simplicity, these actors can be placed along two axes—one reflecting whether they are consensus *builders* or consensus *critics*, the other whether they are operating *within* the monetary policy circle or assessing policy from *without*. This leads to a typology of four kinds of actors, as described in table 1.

[41] Blinder and Reis, *Kansas City Fed Symposium*, 2005, pp. 41-42
[42] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 42

Table 1.1 Typology of Historical Actors

	Consensus builders	Consensus critics
Fed officials	Most policymakers within the Fed, including the Board of Governors and its Chairman	Some few critics among FOMC voting members, especially among the more independent regional Fed Presidents
Non-Fed officials	Academic economists contributing to the emerging consensus Economists in international institutions contributing to the emerging consensus	Academic economists criticizing Fed practices Economists in international institutions criticizing Fed practices

Consensus builders are those who contribute to constructing core beliefs during the period under investigation. Critics are those who challenge some or most of the beliefs forming the prevailing consensus. The second distinction relates to whether actors are within or outside the policy circle. The insiders are actors actively engaging in policy deliberation at the central bank, notably the voting members of the Federal Open Markets Committee (FOMC). This committee is the main monetary decision-making body within the Fed, setting short-term targets for the federal funds rate—the main policy instrument. The FOMC consists of the Board of Governors, including the Chairman of the Board, as well as the Presidents of the twelve regional Federal Reserve Banks. Only five presidents serve as voting members at a time on a revolving basis, with the head of the New York Fed as a permanent voting member.

Core beliefs among leading Fed officials, notably the voting members of the Federal Open Market Committee, including the appointed Fed Governors, can also be traced through the manifold speeches and testimonies given at frequent intervals. Most attention will be given to actors identified as leading architects of the emerging doctrines. Alan Greenspan would seem to be the major candidate. He has been described as a dominating force in FOMC meetings. In his own words, however, he stresses the fact that the "chairman has less unilateral power than the title might suggest."[43] In contrast, other FOMC members testify to the predominance of Greenspan's views. For instance, in his memoirs, former Governor Laurence H. Meyer writes that FOMC members "sometimes got giddy with the prospect of actually having an opportunity to debate some aspect of the policy decision at the meeting and decide on it, as opposed to accepting the Chairman's recommendation."[44] Alan Blinder, himself a Vice Chairman of the Board of Governors and a voting member of the FOMC from June 1994 to January 1996, writes that "no one has ever doubted that Alan Greenspan [was] 'more equal'

[43] Greenspan, 2007, *Age of Turbulence*, p. 101
[44] Laurence H. Meyer, *A Term at the Fed: An Insider's View*, Harper Collins, 2004, p. 47

than the others." He goes on, pointing out that the chairman is "virtually never on the losing side of a monetary policy vote." Thus to a significant degree, "FOMC decisions are *his* decisions" (emphasis in original).[45] Later he added "dissent has been minimal during the Greenspan era, especially in recent years." In the span of seven full years and 60 FOMC meetings from 1998 to 2004, the number of recorded dissents was 14. Thus Blinder concludes, "[u]nder the Greenspan standard, his rule is rarely questioned."[46]

Still, the chairman's decisions are tempered by the other FOMC members, so that a "chairman who needs to build consensus may have to move more slowly than if he were acting alone." Greenspan's statements and policy proposals at FOMC meetings should thus be seen in the context of "decisionmaking by committee," creating a dynamic of its own. Importantly, such a setting for policymaking "makes it very difficult for idiosyncratic views to prevail."[47] One example was Greenspan's controversial views on changes in American productivity growth. When trying to convince other FOMC members in the spring of 1997, "the Chairman's insight played to an unresponsive audience," according to FOMC member Laurence Meyer. "The staff and most of the other committee members [were] not convinced."[48] Thus the chairman moved carefully when presenting his arguments before the committee, slowly building consensus on how to incorporate this factor into decision-making.

The above discussion suggests that the core beliefs of the Fed chairman are key to understanding the evolving monetary doctrines and practices. However, FOMC decisions were also extensively informed by ongoing research and discussions, taking place within monetary policy circles and in wider spheres of monetary debate. Thus it is important to look into the evolving intellectual framework of a broader set of players.

One influential voice was that of Ben Bernanke. He dedicated his academic career in large part to monetary issues. Insights gained through years of painstaking research would weigh heavy on decisions and advice given as he left academia to enter the inner policy circles of national macroeconomic policymaking, first as Fed Governor (September 2002-June 2005), then briefly as head of President Bush's Council of Economic Advisers (June 2005-January 2006) and eventually as Fed Chairman (February 2006-present), taking over the monetary reins after Greenspan. Bernanke has explicitly stated that "it was my objective to bring my knowledge, my research on the Great Depression, on financial markets, on the economy to do

[45] Blinder, *Central Banking*, 1999, p. 21
[46] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 73-74
[47] Blinder, *Central Banking*, 1999, p. 21
[48] Meyer, *A Term at the Fed*, 2004, p. 125; quoted in Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 52

the best I could to bring that to the actually policy-making arena."[49] The interpretations of the troubling events of the 1930s and the lessons drawn from this analysis would influence how he interpreted and framed the challenges facing monetary authorities while serving as Fed official. It will be argued that his views on the Great Depression would color his understanding of the "Japanese disease" and the likelihood of similar problems emerging in the U.S. economy. These views seem to have had a significant impact on policymakers' understandings of deflationary pressures—the topic of a separate chapter dedicated to the Fed's deflation scare of the early 2000s. Moreover, Bernanke's views on the initial causes of the Japanese crisis as well as the onset of the Great Depression would color his understanding of how the Fed should react to asset bubbles as they formed, and after they crashed—the topic of a chapter on the Fed's fear of financial fallouts. Being a leading authority on the monetary issues of the Great Depression and a towering figure within monetary research circles, it should be expected that his opinions would have a significant impact on Fed thinking about these important issues, as Bernanke entered the inner monetary policy circle in 2002.

Another important figure, though perhaps more of a practitioner than an academic, is Donald Kohn. Having served as Director of the Division of Monetary Affairs and Secretary of the Federal Open Market Committee (1987-2002), before himself becoming a permanent voting member of the committee as Fed Governor from 2002, he experienced at close hand how Fed doctrines and practices evolved during the Greenspan era. Kohn started his central banking career even earlier, first as an economist at the Federal Reserve Bank of Kansas (1970-75) before moving on to the Board of Governors in Washington D.C., where he served in various positions. Given his long service at the Fed, it should be expected that he would reflect the prevailing consensus and core beliefs as they evolved over the span of the Great Moderation. Being a Fed official rather than an independent thinker within academia, in contrast to the background of Bernanke, Kohn is likely to have internalized his role as a Fed spokesman, explaining and rationalizing Fed actions and policy opinions. His numerous speeches and writings should thus be read with this perspective in mind.

There is a rich body of source material to draw upon in assessing the monetary doctrines of the Fed during this time period, besides those related directly to policy deliberations. One way to access intellectual developments influencing policies and beliefs is to explore papers presented and discussions undertaken at the annual central banking symposiums organized by the Federal Reserve Bank of Kansas City at Jackson Hole, Wyoming. Many of the ideas presented by monetary policymakers and researchers at these conferences reflect an emerging consensus on the issues at hand: What should be the goals of monetary policy? What is the

[49] Real Time Economics, "Bernanke on Dentistry and Airport Security," wsj.com, December 7, 2009

appropriate policy tool and how does this tool affect overall market conditions? What, if any, should be the role of monetary policy in regard to asset booms and busts?

A rough body count of the participants at the 2005 symposium discussing the merits of Greenspan shows more than 30 Fed officials, around 25 central bankers from various emerging markets and European countries (including the Governor of the central bank of Norway), around 15 journalists from the financial press, around 10 executives and chief economists from the financial services industry, 5 officials from international policy institutions (including the Organization for Economic Co-operation and Development, the International Monetary Fund, and the World Bank) and a wide range of economists.[50]

Several researchers have developed important contributions to the development of U.S. monetary doctrines. Some of this research centers upon the importance of historical experience informing subsequent monetary policy. An important body of research is aimed at explaining what went wrong during the Great Depression and what constituted the main drivers of the recovery. Another set of research investigates what went wrong during the Great Inflation of the 1970s and what assumedly went right during the Great Moderation that followed. Christina Romer stands out in both regards. She is a long-time economist at the National Bureau of Economic Researcher where she co-directs the Program in Monetary Economics with her husband David Romer. This program is dedicated to the study of "the mechanisms through which monetary policy operates" and how "alternative approaches to making monetary policy" affects the economy.[51] The roster of this program reads like a who's who of mainstream monetary economics and history, including names such as Robert Barro, Olivier Blanchard, Alan Blinder, Michael Bordo, Bradford DeLong, Barry Eichengreen, Marvin Goodfriend, Gregory Mankiw, Bennett McCallum, Frederic Mishkin, Ricardo Reis, Kenneth Rogoff, Anna Schwartz, Lawrence Summers, John Taylor, and Michael Woodford—all prolific researchers and writers, some of which will figure in later discussions.

The body of literature emanating from these researchers and numerous others has had an important influence on Fed officials and thus on the development of monetary doctrines and practices during the Greenspan years. Ideas coming out of these research circles figure prominently in the presentations given at the Jackson Hole symposiums, and the recorded discussions taking place after any given presentation can give some insight into the immediate responses by Fed officials and other central bankers to the views presented. Thus a part of the investigation should focus in on research papers discussed at these annual

[50] See list of "Participants," *Kansas City Fed Symposium*, 2005
[51] "The NBER Monetary Economics Program," http://www.nber.org/programs/me/me.html

conferences, both when the papers present views contributing to the forming consensus as well as views confronting the consensus.

Among those confronting the prevailing worldviews of central bankers are economic researchers operating within important international policy and research institutions, such as the International Monetary Fund (IMF) and the Bank for International Settlements (BIS). In 2005, an IMF chief economist created some controversy in the otherwise congenial atmosphere at Jackson Hole when questioning some of the basic beliefs encapsulated in the so-called "Greenspan doctrine"—the notion that financial developments during the Great Moderation was almost exclusively a beneficial and stabilizing factor for the American economy.[52] Likewise, two years earlier, a BIS chief economist presented views that were largely dismissed by leading Fed officials, including Greenspan and Bernanke, giving rise to a still not resolved controversy on monetary policy and asset bubbles.[53]

These debates will be explored in later chapters, hopefully revealing some of the major issues of contention as well as profound beliefs forming the core of monetary doctrines as they evolved, especially in the second half of the Great Moderation.

Conceptual Framework

In light of the Great Inflation, revealing weaknesses in the postwar practice of policy, a new body of literature emerged pointing to the importance of the institutional framework within which policy is formulated and implemented. This gave rise to a debate on "rules" versus "discretion."[54] The concerns raised point to problems arising from incentives among central bankers and their constituents, stemming from what could be labeled the "incentive problem"—behavioral constraints arising from the specific institutional context within which decisions are made. What is largely missing from this literature, which stresses the need to build *reputational* capital or tie policymakers hands by some set of rules,[55] is the equally important question of the *informational* capital of the monetary authorities. In other words, even if institutional framers could somehow solve the incentive problem, one would still be faced with the not inconsequential problem of acquiring the right information in order to reach well-informed decisions and implement policy that will perform its intended functions.

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[52] Raghuram G. Rajan, "Has Financial Development Made the World Riskier?," *Kansas City Fed Symposium*, 2005

[53] Claudio Borio and William R. White, "Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes," *Kansas City Fed Symposium*, 2003

[54] Finn E. Kydland and Edward C. Prescott, "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy*, vol. 85, no. 3, 1977, pp. 473-492

[55] A discussion of this issue can be found in Blinder, *Central Banking*, 1999, pp. 38-48

In other words, policymaking is confronted with the inescapable "knowledge problem," namely whether the models policymakers make use of correspond to reality in a satisfactory way.

The market process and the political process possess fundamentally different knowledge-generating properties. Rather than continuous market signals, policymakers must make use of proxy signals, gathered through the cumbersome process of collecting data and constructing statistical time series. Central bankers are thus in the business of data processing, going through a wide range of statistics before formulating policy responses to perceived risks surfacing in the economy. Greenspan has been portrayed as an "empiricist par excellence," scrutinizing "the details in the data."[56] Moreover, before each FOMC meeting, the Fed staff collects and interprets a wide range of data, handed over to committee members.

However, the implications of the data at hand are dependent upon the actors' models of how the economy works and the way in which monetary policy influences the policy goals. Such models are subject to revisions, sometimes gradual and sometimes dramatic. Episodes in which policy is perceived to be dysfunctional on some level would predictably lead to thorough revisions. One such episode was the Great Depression of the 1930s, another the Great Inflation of the 1970s. It would seem that monetary policy is in the process of going through a new set of revisions in light of the recent financial crisis and Great Recession. Other revisions are more gradual, as when perceived changes in the economic landscape and policy challenges lead decision-makers to incrementally change their worldviews.

One unresolved issue within macroeconomic thought is the conception of the interest rate and an agreed upon understanding of the monetary transmission mechanism, that is, how monetary policy (and interest rate setting by the banking sector) affects the economy. In the words of Axel Leijonhufvud, a Swedish-born economist who have written extensively on the history of economic ideas, the "theory of the interest rate mechanism" has been "at the center of the confusion in modern macroeconomics.[57] The mainspring of this issue is the writings of the late 19th century Swedish economist Knut Wicksell, who made important contributions towards developing a modern framework for understanding monetary policy. According to Leijonhufvud, modern monetary and macroeconomic theory starts with Wicksell's *Geldzins*

[56] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 16
[57] Axel Leijonhufvud, "The Wicksell Connection: Variations on a Theme," Working paper no. 165, Department of Economics, UCLA, 1979

und Güterpreise (1898).[58] The English title is *Interest and Prices*, which neatly sums up the main message of the book—how the price level is determined by the rate of interest.[59]

Wicksell hypothesized a "natural rate of interest," that is, the rate "which is *neutral* in respect to commodity prices, and tend neither to raise nor to lower them." This notion of the interest rate mechanism gained new ground during the Great Moderation and can be seen as a main academic approach to monetary issues today, as witnessed by Michael Woodford's influential *Interest and Prices* (2003), sharing the title of Wicksell's work.[60] The modern twist is that the natural rate is the one which ensures a stable rate of inflation (rather than zero inflation, as Wicksell hypothesized). Moreover, it is believed that a "neutral" interest rate ensures that output and employment grow along their "natural" level, that is, at maximum sustainable capacity.[61]

As pointed out by Leijonhufvud, there is however a second theme of the book, which "hovers in the background," namely, the issue of "intertemporal disequilibrium as the key to the understanding of the business cycle." Wicksell thought that the "natural rate" was determined by the voluntary levels of saving and investment. This perspective suggests that market rates diverging from the equilibrating natural rate will cause imbalances, which could lead to economic crises.

Importantly, there seem strong reasons to believe that prices will in fact not remain stable when market rates converge with this conception of the natural rate, due to the fact that productivity growth tends to push down prices. Thus maintaining low inflation or zero price growth in the face of strong economic growth will tend to push down the central bank manipulated money market rate below the natural rate. Such an understanding is engrained in the monetary equilibrium approach, stressing real and financial imbalances that can arise when the money supply temporarily exceeds money demand.[62]

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[58] Axel Leijonhufvud, "The Wicksellian Heritage," Published as "Wicksells Erbe" in a volume accompanying the facsimile reissue of the original German edition of *Geldzins und Güterpreise*, in the series *Klassiker der Preis- und Geldtheorie*, Verlag Wirtschaft und Finanzen, Düsseldorf, 1997. English version in *Economic Notes*, 26:1, pp. 1-10

[59] Knut Wicksell, *Geldzins und Güterpreise*, 1898; English translation by R. F. Kahn, *Interest and Prices: A Study of the Causes Regulating the Value of Money*, Macmillan, 1936

[60] Michael Woodford, *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press, 2003

[61] In the words of Blinder and Reis, 2005, p. 24, "In modern New Keynesian models of monetary policy, it often appears as the real rate of interest that makes the output gap equal to zero, which makes the difference between r and r* a natural indicator of the stance of monetary policy. As with the natural rate of unemployment, there are also many ways to estimate the neutral rate of interest. Some propose measuring the neutral interest rate as the rate at which inflation is neither rising nor falling"

[62] For a description of this approach, see Steven Horwitz, *Microfoundations and Macroeconomics*, Routledge, 2000

The original Wicksellian framework incorporates the banking sector in macroeconomic analysis as a potential destabilizing and dis-equilibrating force, and emphasizes the interest rate as a coordinating mechanism for savings and investment decisions. Such an understanding is largely absent in modern macroeconomics. Instead, the interest rate tends to be seen as a policy lever and the banking system is assumed to perform its intermediating role between savers and investors. In contrast, with the savings-investment-interest rate nexus intact, a potential unifying framework for macroeconomic thought and analysis emerges—incorporating the role of money, banking, interest rates, financial markets, pressures on consumer prices and booms and busts.

An alternative vision to the "price stability" and "monetary equilibrium" approaches outlined above is that of Hyman Minsky, the originator of the "financial instability hypothesis." This perspective underlines the dynamic nature of financial markets, and seriously questions "all those theories that treat capitalist economies with well-developed financial structures as stable."[63] Thus Minsky sees capitalism as inherently unstable. In his analytical framework, "good times" or "periods of tranquility" lead financial market participants to take on more risk or what is described as "balance sheet adventuring." In the end, unsustainable financial activities give rise to a systemic crisis adversely affecting the real economy as well. Thus "full employment with stable prices cannot be sustained" because of the forces at work within the financial sector eventually leading to "the disruption of tranquility."[64] What is largely missing from this perspective is the potential dis-equilibrating role of monetary policy related to savings and investment. Such a view is notably absent in Fed doctrines as well.

These differing visions of how the macro-economy works, and the policy implications involved, can be sighted in the discussions of monetary doctrines in the following chapters. Notably, some Fed critics seem to adhere to a perspective emphasizing the distortive nature of low interest rates, pointing out that "price stability was not enough" to ensure stable and sustainable economic growth during the Great Moderation, thus coming close to the monetary equilibrium position.[65] Consensus builders, on the other hand, seem to stress the desirability of price stability, defined as low, constant inflation. Moreover, both Fed policymakers and critics from time to time make arguments that seem to imply that the macroeconomic stability of the Great Moderation could give rise to periods of financial instability, as suggested by the Minsky perspective. This simplifying, though hopefully illuminating, distinction between opposing models will figure in the background in the subsequent analysis.

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[63] Edward E. Downe, "Minsky's model of financial fragility; a suggested addition," *Journal of Post Keynesian Economics,* vol. IX, no. 3, 1987

[64] Hyman P. Minsky, *Stabilizing an Unstable Economy*, MacGraw Hill, 2008 [originally published in 1986], pp. 48, 197, 199

[65] William White, "Is Price Stability Enough?," *BIS Working Papers*, no. 205, 2006

As the above discussion suggests, this study will focus in on *epistemic* problems, not behavioral constraints, facing monetary policymakers. Chapter two will start off the investigation by briefly discussing the main elements of the emerging consensus of this period. The subsequent four chapters will investigate the historical events and intellectual responses that helped shape this consensus as well as the specific policy practices of the Fed. Chapter three will explore the lessons drawn from the Great Depression and Great Inflation and how they influenced the course of policymaking and monetary doctrines in the U.S. Chapter four will assess how these lessons were applied to policymaking during the first decade of the Greenspan era, and how ongoing challenges gradually changed the policy regime. Chapters five and six will explore how new challenges, arising in the second half of the Greenspan era, led to additional shifts to the policy regime.

The analysis will trace how policy doctrines and practices evolved in response to different perceived threats—those of inflation, financial fallouts and deflation—giving ample attention to three key policy episodes that most clearly display these concerns, as outlined above. The question of the decision-making context will be briefly revisited in the conclusion, assessing whether the evolving monetary framework under Greenspan represented a move towards increased discretion.

2. THE JACKSON HOLE CONSENSUS

> "One of the most striking features of the economic landscape over the past twenty years or so has been a substantial decline in macroeconomic volatility. […] Several writers on the topic have dubbed this remarkable decline in the variability of both output and inflation 'the Great Moderation.'"[66]
>
> —Ben Bernanke (2004)

At the end of the 20th century four Fed researchers, including future Fed Governors Ben Bernanke and Frederic Mishkin, reflected upon the newly formed consensus on economic policy in the industrialized countries. Communism had come to an end and with it the apparent end of state-directed development. A newfound belief in giving markets a freer reign had emerged. However, as the authors noted, it would be a mistake to "conclude that no room is left over for government policy to promote economic growth and stability." Besides the continued importance attached to fiscal policy and various regulatory responsibilities (such as environmental and financial regulation), in addition to the government's classical role of maintaining infrastructure, both institutional (such as the legal system) and physical (such as roads and bridges), a defining characteristic of the new political economy was the fact that monetary policy "has emerged as one of the most critical government responsibilities."[67]

In other words, the central bank had emerged as a dominant institution for conducting economic policy. A key element of the new strategy for promoting growth and stability was to ensure low, stable inflation. The consensus centered upon monetary policy as the most effective tool to attain these goals.

Under this new regime, both inflation and output displayed a remarkable tendency to stabilize around the desired goals. Inflation was moderate and relatively invariable, accompanied by robust growth interrupted by few and short-lived recessions. After recovering from the painful Reagan recession of the early 1980s, resulting from deliberate monetary tightening to bring down inflation, the U.S. economy went through long periods of expansion—one from 1982 to 1990 that lasted almost eight full years, followed by one that more or less lasted all the way up to the Great Recession (2007-2009), slightly punctured by a brief and mild recession in 2001.[68]

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[66] Ben S. Bernanke, "The Great Moderation," remarks at the meetings of the Eastern Economic Association, Washington, DC, February 20, 2004

[67] Ben S. Bernanke, Thomas Laubach, Frederic Mishkin and Adam Posen, *Inflation Targeting: Lessons from the International Experience*, Princeton University Press, 1999, p. 3

[68] Olivier Blanchard and John Simon, "The Long and Large Decline in U.S. Output Volatility," *Brookings Papers on Economic Activity*, no. 1, 2001, p. 135

These developments strengthened the reputation of central bankers as successful inflation stabilizers and recession preventers. Some ascribed these benign circumstances to the talents of Greenspan or, more generally, to an improved framework of conducting monetary policy in the advanced countries, most of which experienced similar developments.[69] This reinforced the view that stabilization policy was best left to central bankers; that price stability was a noble and highly beneficial goal; and that monetary policy was a predictable and powerful tool in preventing adverse economic outcomes.

Looking back at the pre-crisis consensus, Charles Bean, Deputy Governor at the Bank of England, reflected upon the beliefs of policymakers during the Great Moderation. The prevailing worldview had been apparent in many of the arguments presented by leading monetary policymakers and researchers at the annual Jackson Hole symposiums. Thus it was only fitting that it should be named the "Jackson Hole consensus." Bean summed it up as a set of core beliefs that had evolved among central bankers and central banking experts, ranging from a belief in the authorities' ability to manage inflation expectations among the public to the disbelief in any constructive role for monetary policy in reining in asset booms.[70]

Monetary, not fiscal, policy was the main instrument in the conduct of stabilization policy. Apart from the role of "automatic stabilizers" (fiscal stimulus arising automatically in a downturn, due to falling revenues and rising expenditures), fiscal policy was seen as "unsuitable as an instrument of macroeconomic demand management." Monetary policy was thus "assigned the primary role in short-term aggregate demand" through the manipulation of short-term interest rates.

In other words, monetary policy was the main instrument in the conduct of macroeconomic stabilization policy, or "macroeconomic demand management" according to professional jargon. The main tool of monetary policy was some short-term money market rate—in the U.S. the overnight rate in the market for reserve balances (the federal funds rate)—controlled by the use of open market operations (central bank purchases or sales of assets by money creation or destruction).

The transmission mechanism by which monetary policy affected the targeted goals of inflation, output and employment was through the public's expectations of future inflation

[69] Blanchard and Simon (2001, p. 135) takes issue with this view, contending that the decline in output volatility "is not a recent development—the by-product of a 'New Economy' or of Alan Greenspan's talent. Rather it has been a steady decline over several decades, which started in the 1950s […], was interrupted in the 1970s and early 1980s, and returned to trend in the late 1980s and the 1990s." Bernanke puts more weight on monetary policy as a major contributing factor. Ben S. Bernanke, "The Great Moderation," remarks at the Eastern Economic Association, Washington, DC, February 20, 2004

[70] Charles Bean, Matthias Paustian, Adrian Penalver, and Tim Taylor, "Monetary Policy after the Fall," *Kansas City Fed Symposium*, 2010

and the immediate impact the manipulation of short-term interest rates had on longer-term interest rates (such as bond yields) and asset prices. There was always the danger that this transmission mechanism might be impaired by problems in the "credit channel"—a concern raised by Bernanke—but the banking system was mostly out of sight in the models monetary policymakers and policy prescribers were making use of—the models of the New Keynesian synthesis that had emerged during the Great Moderation.[71]

The weight given to the role of expectations in the performance of the economy on a macro level led to a pronounced belief in the need to "anchor" inflation expectations. One preferred tool was establishing an inflation target, communicated to the public and credibly committed to by the monetary authorities. Many industrial countries established formal inflation targets, usually somewhere around 2 percent. However, in the U.S., such a target was never formalized, but rather emerged informally. The public came to expect such a ceiling, and monetary policymakers themselves came to prefer stabilizing inflation somewhere around this ideal.[72]

In order for the central bank to credibly stabilize inflation expectations in the long run, the consensus held that monetary policymakers should be shielded from external pressure by legislators or administrators believed to have shorter time horizons and less benign incentives. Thus the need for central bank independence, understood as "instrument independence." The policy goals were set by the legislature giving the central bank its mandate, but policymakers at the central bank could themselves decide upon the preferred instruments and how to make use of them in the conduct of policy.[73]

The case for independence was further strengthened by the academic literature that stressed the problem of "time inconsistency" in the dynamic interplay between the authorities conducting stabilization policy and the public's expectations. If the authorities tried to engage in "optimal policy," based upon the ever-changing dictates of circumstances, this would

[71] Ben S. Bernanke and Mark Gertler, "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," *Journal of Economic Perspectives*, vol. 9, no. 4, 1995 pp. 27-48

[72] In 1996, Greenspan defined "price stability" as zero inflation. See *Transcript*, July 2, 1996; quoted in Hetzel, *Monetary Policy*, 2008, p. 197. In the aftermath of the Asian crisis and the dotcom bust, the FOMC developed an aversion to inflation falling below 1 percent. The preferred ceiling seems to have been around 2 percent.

[73] As explained by Bernanke, "A useful distinction is that between 'goal independence' and 'instrument independence.' Goal independence for central banks—the freedom of the central bank to set its own goals—is difficult to justify in a democratic society, but, as I will argue today, instrument independence—the ability of the central bank to determine the appropriate settings of monetary policy without interference—is vital for economic stability." Ben S. Bernanke, "Central Bank Independence, Transparency, and Accountability," speech at the Institute for Monetary and Economic Studies International Conference, Bank of Japan, Tokyo, Japan, May 25, 2010, fn. 2

change people's expectations and behavior in such a way as to lead to poorer performance, not improved outcomes.[74]

However, there was still scope for the authorities to stabilize output and employment to some degree, as long as this was done within the overall framework of "price stability"—low and stable inflation. Certain perceived imperfections of the economy, notably the inability of wages and prices to perfectly adjust to changes in the short run, gave room for "constrained discretion," in the words of Bernanke.[75] Thus the notion of "flexible" inflation targeting, which emerged in most countries during the Great Moderation, usually formalized in central bank mandates as the combination of inflation and output targeting, though with more weight given to the former goal.[76] In the U.S., the Fed was given a dual mandate of "stable prices" and "maximum employment" (of which the latter can be understood as an output goal). In contrast to central banks of other major industrial countries, this legislation put equal weight on the two goals.[77] The output target was formalized as zero deviance from the idealized long-term growth rate. Any divergence was ascribed as an "output gap," to be corrected by the monetary authorities, as long as the long-term goal of stable inflation was ensured.

The notion of monetary targets was scrapped, as central bankers focused in on the interest rate as the main policy tool and the price level as the ultimate policy target. The academic literature that emerged ignored monetary aggregates altogether, including credit aggregates, stressing instead the idea of a "neutral" interest rate delivering constant inflation and a zero output gap.[78] The neutrality was ensured by anchoring expectations to the inflation target, causing prices and wages to be well adjusted, thus ensuring optimal capacity utilization.

The narrow focus on movements in the average level of consumer prices (inflation) and the desired level of output and employment, led central bankers and their intellectual supporters within academia to largely ignore dysfunctional developments that could arise in asset

[74] Finn E. Kydland and Edward C. Prescott, "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy*, vol. 85, no. 3, 1977, pp. 473-492
[75] Ben S. Bernanke, "'Constrained Discretion' and Monetary Policy," remarks before the Money Marketeers of New York University, New York, N.Y., February 3, 2003
[76] For instance, the legal mandate of the European System of Central Banks (ESCB) stressed that "the primary objective […] shall be to maintain price stability," adding that "without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Community." The policy "remit" of the Bank of England similarly states that the ordering of the two goals as "(a) to maintain price stability, and (b) subject to that, to support the economic policy of Her Majesty's Government, including its objectives for growth and employment."
Blinder and Reis, *Kansas City Fed Symposium*, 2005, pp. 28-29
[77] In fact, as discussed later, the legislation state three goals, maximum employment, stable prices, and moderate long-term interest rates. But the interest rate goal is implied by the price goal, since stable prices ensure moderate nominal interest rates.
[78] Olivier Blanchard, Giovanni Dell'Ariccia, and Paolo Mauro, "Rethinking Macroeconomic Policy," International Monetary Fund, 2010

markets and the importance of the overall functioning of financial institutions. Moreover, financial markets were widely believed to be efficient—a notion propounded by Chicago School efficient market thinking. It was also suggested by the Greenspan notion of fully functioning financial markets within the institutional framework that emerged during the Great Moderation, a belief that was encapsulated in the "Greenspan doctrine."[79] Little attention was given to the dynamic interplay of financial market participants and monetary policy actions such as commitments by the central bank to contain financial stress.

Even though asset markets could undergo periods of "irrational exuberance" from time to time,[80] the consensus was that the authorities should refrain from intervening in incipient asset booms. Fed officials held that it could prove hard to diagnose whether rapid asset price growth was in fact unsustainable or rather reflecting strong fundamentals. Instead, the central bank should "mitigate the fallout" and "ease the transition to the next expansion"—a commitment to cushion off drops in asset markets that was dubbed the "Greenspan put."[81] Even if the monetary authorities were to correctly diagnose a bubble in the making, the use of monetary policy tools to curb the boom would still not be appropriate as higher interest rates and tighter money would come with the cost of lowered output and higher unemployment.

The final major component of the Jackson Hole consensus was the widespread notion that large-scale financial crises was something relegated to the past in the case of the industrialized world, and at present mainly a problem for emerging markets with less sophisticated financial institutions and a more volatile macroeconomic framework. Thus there was little concern that a systemic crisis could arise in the U.S. or elsewhere among the advanced countries.[82]

Great faith was placed in the role of price stability to ensure overall soundness and stability. In the words of Bean, "price stability and financial stability were natural bedfellows, the successful achievement of one facilitating the attainment of the other."[83] In other words, price stability was seen as a prerequisite for stability in both financial markets and the wider economy.

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[79] For Greenspan's views on financial market developments and regulations, see for instance Alan Greenspan, "Government regulation and derivative contracts," remarks at the Financial Markets Conference of the Federal Reserve Bank of Atlanta, Coral Gables, Florida, February 21, 1997

[80] Alan Greenspan, "The Challenge of Central Banking in a Democratic Society," speech at the Annual Dinner and Francis Boyer Lecture of The American Enterprise Institute for Public Policy Research, Washington, D.C., December 5, 1996

[81] Alan Greenspan, "Monetary policy and the economic outlook," testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999

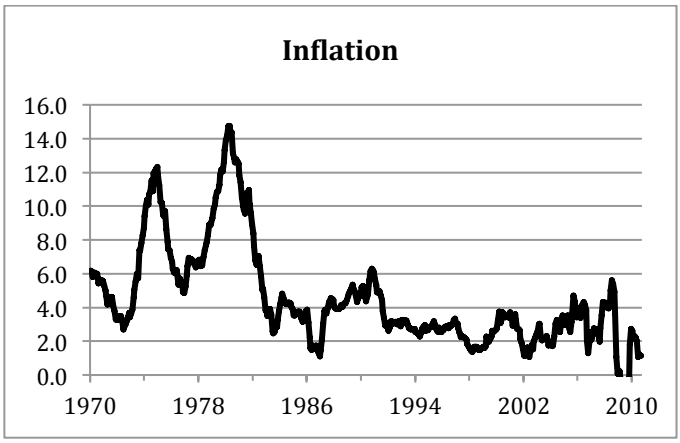
[82] Several researchers have commented upon this. See, e.g., Carmen Reinhart and Kenneth Rogoff, *This Time Is Different: Eight Centuries of Financial Folly*, Princeton University Press, 2009; See also Bean *et al.*, "Monetary Policy After the Fall," *Kansas City Fed Symposium*, 2010

[83] Bean *et al.*, "Monetary Policy After the Fall," *Kansas City Fed Symposium*, 2010, p. 3

While the causes of the observed moderation in output volatility and inflation are open to debate, policy makers attributed an important part of the perceived improved macroeconomic performance to better policy. Ben Bernanke is a prominent proponent of the view that improved macroeconomic management, especially within the field of monetary policy, was a major cause of the Great Moderation. The stability of inflation and output was all the more impressing when compared to developments of the 1970s—years of high and accelerating inflation combined with a volatile economic environment.

In the words of Bernanke, policymakers of this period suffered from "inflation pessimism" and "output optimism." They were pessimistic about the ability of monetary policy to hold inflation in check. At the same time, they were overly optimistic about the possibility to smooth out fluctuations in output and permanently pull down the unemployment rate. The economy went off track "because monetary policymakers labored under some important misconceptions about policy and the economy."[84] As these misconceptions were corrected, central bankers took control of inflation, stabilizing its rate at a low level, in effect becoming "heroes of the zeroes."[85]

Figure 2.1 Consumer Prices, 1970-2010



Source: St. Louis Fed, FRED (CPIAUCNS, % change from a year ago)

Figure 2.1 illustrates the change in inflation behavior—both its downward trajectory as well as the decrease in volatility—by depicting the annual percentage changes in prices for all urban consumers (headline inflation) during the last 40 years. As shown, inflation reached its peak at the end of the 1970s and early 1980s, then trended downwards before reaching a low point in the early 2000s. A moderation in output volatility was likewise pronounced in this period. Commentators agreed that these developments were beneficial to the economy,

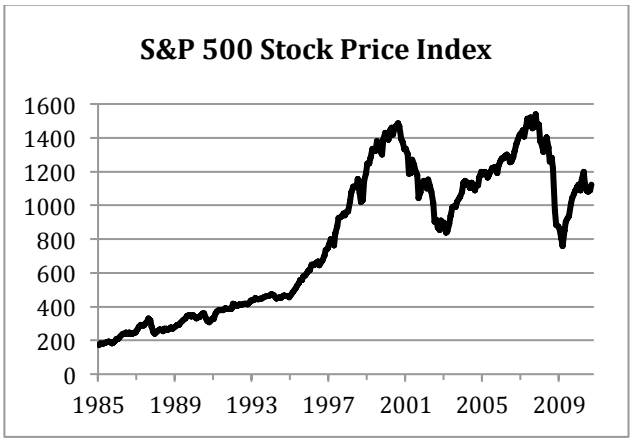
[84] Ben S. Bernanke, "The Great Moderation," remarks at the meetings of the Eastern Economic Association, Washington, DC, February 20, 2004
[85] *Economist*, "Heroes of the Zeroes," October 18, 2007

compared with the volatile, unpredictable 1970s. Low and stable inflation was seen as a prerequisite to overall economic stability and as a yardstick by which the success of policy was measured.

In 2001, Olivier Blanchard, a professor of economics at the Massachusetts Institute of Technology, and John Simon, a researcher at the Reserve Bank of Australia, stated that they were "reasonably confident in predicting" that "the increase in the length of expansions is here to stay." A "major reversal" to the moderation in output volatility appeared "unlikely." The implications were clear, namely "a much smaller likelihood of recessions." However, on a casual note they remarked: "Interestingly, the decrease in output volatility has not been reflected in a parallel decrease in asset price volatility."[86]

Notably, stock prices went through two major boom-bust episodes during the 1990s and 2000s, in addition to one dramatic crash in October 1987. (See figure 2.2.)

Figure 2.2 Stock Prices, 1985-2010



Source: S&P/Robert Shiller

Asset price fluctuations was of secondary concern to monetary practitioners and theoreticians during most of the postwar period and up towards the end of the century, as macroeconomic thought focused in on another major puzzle, how to cope with fluctuations in output, employment and consumer prices.

[86] Blanchard and Simon, "The Long and Large Decline," 2001, p. 164

3. THE EVOLVING MONETARY FRAMEWORK

> "Our objective is to promote maximum sustainable employment and stable prices over time. These goals are enshrined in law, and they also make sense in economic theory and practice."[87]
>
> —Fed Vice Chairman Donald Kohn (2009)

In order to gain a better understanding of how monetary doctrines and practices evolved during the Great Moderation, it is useful to place these developments in a broader historical context. Both the monetary doctrines guiding Fed decisions and the academic debate related to stabilization policy can be seen in light of historical experience.

The first major monetary episode in the history of the Fed, and one that profoundly shaped the thinking of U.S. monetary policymakers, was the "Great Contraction"—the early phase of the Great Depression in which output, prices and employment dropped at record rates. Not only did this episode leave its lasting mark on policymakers' understandings and priorities, it also gave rise to a new understanding of economic dynamics and challenges on an aggregate or "macro" level among the economics profession. In the words of Ben Bernanke:

> "To understand the Great Depression is the Holy Grail of macroeconomics. Not only did the Depression give birth to macroeconomics as a distinct field of study, but also—to an extent that is not always fully appreciated—the experience of the 1930s continues to influence macroeconomists' beliefs, policy recommendations, and research agendas."[88]

According to UC Berkeley economist J. Bradford DeLong, the memory of the Great Depression created a "predisposition on the left and center of political opinion that any unemployment rate was too high […]" Thus when center-left political forces gained the upper hand in the 1960s, the stage was set for an inflationary episode—"America's only peacetime inflation."[89] The Great Inflation would dominate policy concerns for the next generation of practitioners and academic thinkers. Among the lessons drawn were that inflation comes with high costs and that there are limits to what the federal government can achieve through expansionary macroeconomic policies in attempts at stimulating employment and output. Thus a more "realistic view" emerged among policymakers in the 1980s and 1990s.[90]

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[87] Donald L. Kohn, "Monetary Policy in the Financial Crisis," in John D. Ciorciari and John B. Taylor (eds.), *The Road Ahead for the Fed*, Stanford, California, Hoover Institution Press, 2009, p. 52
[88] Ben S. Bernanke, *Essays on the Great Depression*, Princeton University Press, 2000, p. 1
[89] J. Bradford DeLong, "America's Only Peacetime Inflation: The 1970s," *NBER Working Paper Series*, no. h0084, May, 1996
[90] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 39

From Keynesianism to Monetarism

Both episodes—the Great Contraction and the Great Inflation—were followed by major changes in macroeconomic theorizing. The 1930s gave birth to the "Keynesian" revolution, a strand of thought focusing on the need for the government to conduct "countercyclical" policies and "fine tune" unemployment and output to ensure that the economy was humming along at the right speed. The impetus for Keynesian thought and policy-prescription was based on the fear of reliving the economic trauma of the depression. In result, a new set of beliefs profoundly penetrated mainstream academia. According to Paul Samuelson—the leading postwar Keynesian textbook author—the "Keynesian revolution was the most significant event in 20th-century economic science."[91]

This new thinking took some time to be adopted into actual U.S. policymaking. Keynesian policies were only deliberately implemented with the Kennedy-Johnson administration in the 1960s.[92] Combined with "optimistic estimates of sustainable employment and deep pessimism about the ability of economic slack to reduce inflation," the new understanding created an inflationary bias. Fiscal and monetary authorities overestimated the sustainable (non-inflationary) level of economic activity and underestimated the central bank's ability to rein in inflation.[93] Thus the move towards more activist macroeconomic policies, based on the desire to stimulate output and employment, ended up in 1970s stagflation—rising unemployment, volatile output and accelerating inflation. This episode, in turn, led to a loss of faith in traditional Keynesian thought and policymaking.

Within academia this experience gave rise to the "Chicago" counter-revolution, which discarded many of the basic Keynesian tenets and led to new developments within macroeconomic thought and policy prescriptions. The Chicago school of economics has, as such, had a major impact on monetary policy, but in a less straightforward manner than is sometimes assumed. Its leading postwar intellectual figure, Milton Friedman, developed a "Monetarist" interpretation of the Great Depression and the business cycle that put money at

[91] Paul A. Samuelson, "Keynesian Economics and Harvard: In the Beginning," *Challenge: The Magazine of Economic Affairs*, 31, 1988, pp. 32-34; quoted in N. Gregory, "The Macro-economist as Scientist and Engineer," *Journal of Economic Perspectives*, vol. 20, 2006, p. 32

[92] It could be argued that Keynesian ideas were embodied in the *Annual Report of the Secretary of Commerce* of fiscal year 1939 as well as the Employment Act of 1946, two documents that bear the imprint of Keynesian economists. However, "the most important contribution during the 1960s to institutionalizing Keynesianism in government policy was probably the tax cut of 1964 […] heralded as the beginning of a 'new fiscal policy.'" Walter S. Salant "The Spread of Keynesian Doctrines and Practices in the United States," in Peter A. Hall (ed.), *The Political Power of Economic Ideas: Keynesianism across Nations*, Princeton University Press, 1989, pp. 29, 49

[93] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 25

center stage, thus challenging the dominant Keynesian view, which tended to downplay the role of money. In the words of Harvard University economist N. Gregory Mankiw:

> "Most Keynesians viewed the economy as inherently volatile, constantly buffeted by the shifting 'animal spirits' of investors. Friedman [and his co-author] Schwartz suggested that economic instability should not be traced to private actors but rather to inept monetary policy. The implication was that policymakers should be satisfied if they do no harm by following simple policy rules."[94]

Policymakers of the 1960s came to believe that inflation should be attributed to cost-push shocks rather than monetary forces. In the words of Bernanke, "[c]ost-push shocks, in the paradigm of the time, included diverse factors such as union wage pressures, price increases by oligopolistic firms, and increases in the prices of commodities such as oil and beef brought about by adverse changes in supply conditions."[95] Importantly, these shocks were outside of monetary policymakers' control. Thus inflation was believed to be largely outside of their control as well, an understanding reinforcing the "inflation pessimism" of the time.

One explanation to how these beliefs arose can be traced back to the optimistic assessments of output and employment. If neither output nor unemployment is deemed too high—that is, they are assessed to be within sustainable, non-inflationary limits—it follows that forces other than excess demand must be at the root of the problem.[96] Thus other measures than aggregate demand restraint were pursued in attempts at curbing inflation, including wage and price controls. Friedman questioned this thinking, offering the view that "inflation is always and everywhere a monetary phenomenon." Hence, he pointed to the need for controlling the growth in monetary aggregates to hold inflation in check.

Even though Friedman's monetarism gained some influence in the early 1980s, especially in the U.S. and the UK, as monetary policymakers were trying to rein in inflation, central bankers mainly used these ideas on pragmatic grounds. In the U.S., Fed Chairman Paul Volcker (1979-1987) drew upon monetarist ideas to battle the inflationary foe through targeting money growth and letting interest rates rise to unprecedented levels. Figure 3.1 displays the behavior of the real fed funds rate during the chairmanship of Volcker in contrast to the rate under his predecessors Arthur Burns (1970-78) and William Miller (1978-79).

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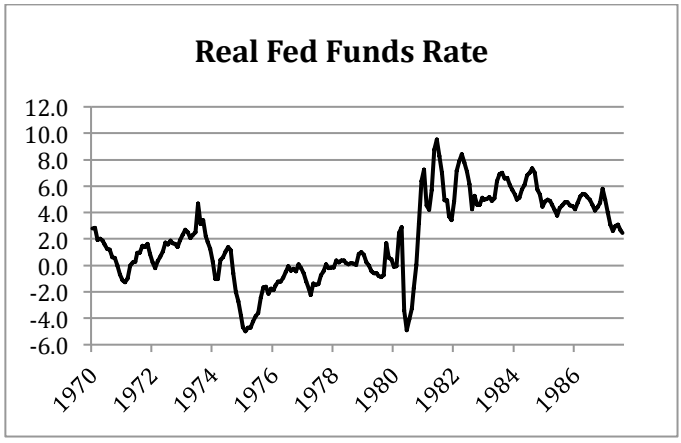
[94] Mankiw, "The Macroeconomist as Scientist and Engineer," 2006, pp. 32-33
[95] Bernanke, "The Great Moderation," 2004
[96] "Fiscal policymakers in the 1960s were sufficiently confident of their estimates of the sustainable rate of unemployment that they consistently attributed inflation that arose before unemployment reached this level to sources other than excess demand." Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 20

Figure 3.1 Inflation-adjusted Monetary Policy Rate, 1970-1987



Source: St. Louis Fed, FRED; Author's calculations (DFEDTAR, CPIAUCNS)

FOMC policy actions under Chairman Burns (1970-78) tended to fall behind the curve, letting inflation rise faster than the nominal fed funds rate, thus pushing the real fed funds rate to record low levels, even into negative ground. Volcker tried to reverse course, first in 1979, an attempt which was aborted in 1980, then implemented more forcefully in 1981, which explains the large swings in the real fed funds rate around the turn of the decade, as seen in figure 3.1. A novel move was putting more weight on monetary aggregates. The new policy procedures were spelled out at the October 6, 1979 FOMC meeting, in which emphasis was shifted onto "supplying the volume of bank reserves estimated to be consistent with the desired rates of growth in monetary aggregates, while permitting much greater fluctuations in the federal funds rate" than before.[97]

During his 1979 Senate confirmation hearing, Volcker stated a point of view that sounded unmistakably monetarist, namely that "if we're going to have price stability" it was "indispensable" to bring down the growth of monetary aggregates.[98] However, he never intended to impose some kind of Friedman monetary rule—a main staple of monetarist policy prescription. Such a rule would have tied the hands of policy-makers by setting the future course of monetary policy within clear boundaries. Instead, Volker sought an effective way to bring down inflation rates, and the monetarist emphasis on the direct control of monetary aggregates gave him this very tool. Milton Friedman was among the most outspoken critics of Volcker's alleged "monetarist" policies. In 1983, he wrote that the "rhetoric of the monetary authorities has indeed been monetarist, but their policies have not been—or, to be generous,

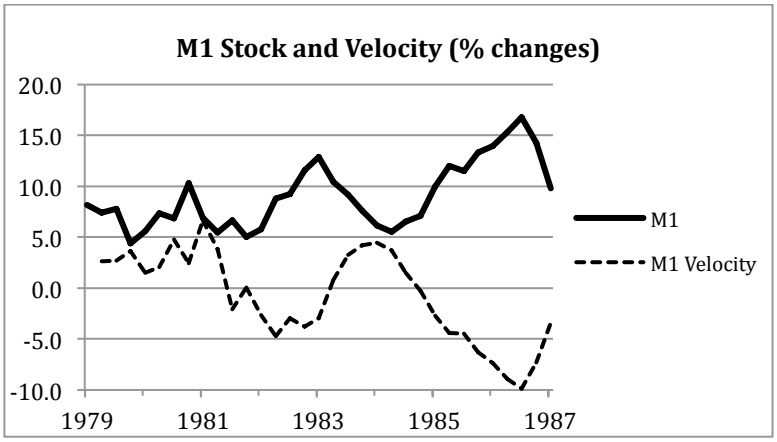
[97] *Record of Policy Actions*, October 6, 1979, p. 4
[98] David E. Lindsey, Athanasios Orphanides, and Robert H. Rasche, "The Reform of October 1979: How It Happened and Why," *Federal Reserve Bank of St. Louis Review*, March/April, 2005, p. 194

have been only partly so."[99] He was concerned that this rhetoric had permanently discredited the belief in a "proper monetarist policy," a concern that turned out to be well founded.

Monetarism soon fell out of fashion as unfolding events discredited this policy approach. For one thing, monetary targets were seemingly harder to pin down than Friedman originally expected. At the same time, the relation between monetary aggregates and prices as well as nominal spending became harder to predict as money velocity (the speed at which money changes hands)[100] became less stable due to financial developments following new U.S. banking legislation in 1980 and 1982.[101]

A full three years after the initial change in operating procedures, in October 1982, the FOMC could satisfactorily notice that "progress in reducing the rate of inflation had been substantial, exceeding expectations of many," but the committee "continued to face uncertainties about the interpretations of the behavior of monetary aggregates in general," due to unstable money demand. Because of "difficulties in interpreting the behavior of M1," the FOMC decided that it "would place much less than the usual weight on that aggregate's movements during this period and that it would not set a specific objective for its growth."[102]

Figure 3.2 The Erratic Behavior of M1, August 1979-August 1987



Source: St. Louis Fed, FRED (M1, M1V)

[99] Milton Friedman, "Monetarism in Rhetoric and in Practice," *Monetary and Economic Studies*, Bank of Japan, 1983

[100] The velocity of money refers to how many times money changes hands through transactions during a certain period of time. If the public increases its preference for holding cash, then velocity drops, and vice versa. Financial innovation can impact this relation, making it harder for the authorities to conduct monetary policy based on the desire to control money and spending in the economy.

[101] Assessing the impact of the new legislation, the FOMC ascertained that "as the Depository Institutions Deregulation Committee (DIDC) implemented recent legislation, depository institutions would be authorized to offer a new account (or accounts) that would be free from interest rate ceilings, would be usable to some degree for transaction purposes, and would be competitive with money market mutual funds. The new account was likely to have a substantial impact on the behavior of M1, but no basis existed for predicting its magnitude." *Record of Policy Actions*, October 5, 1982, p. 8

[102] *Record of Policy Actions*, October 5, 1982, pp. 7-9

The unpredictable behavior of M1 and its velocity during the Volcker era is depicted in figure 3.2. In the words of Gerry Bouey, a former Governor of the Bank of Canada, "We didn't abandon the monetary aggregates, they abandoned us."[103] Thus ended the short-lived "monetarist experiment," or "pseudo-monetarism" as one adherent of this school of thought would characterize it.[104] Looking back, Alan Blinder concludes that "the brief and tumultuous experiment with monetarism between 1979 and 1982 was probably more a marriage of convenience than infatuation. Monetarist rhetoric provided the Fed with a political heat shield as it raised interest rates to excruciating heights."[105]

However, there was another insight coming out of the Chicago-school that would gain more prominence and lasting recognition by the macroeconomics profession—this idea also stemming from Friedman's critique of postwar Keynesian policymaking. Early on, Friedman predicted that attempting to drive down the unemployment rate would have adverse consequences for the economy. This critique gave rise to a debate among economists, which could be referred to as the "Philips Curve controversy."

The "Natural Rate" Framework

The Phillips curve was a simple model of the economy that captured the essence of policymaking and beliefs in the 1960s.[106] It portrayed a permanent trade-off between unemployment and inflation. The conventional wisdom was that acceptable doses of inflation would cure unemployment.[107] In 1960, two prominent American economists, Paul Samuelson and Robert Solow, estimated that an inflation rate of 4 to 5 percent would keep the unemployment rate below 3 percent, stating that such a "price rise would seem to be the necessary cost of high employment and production in the years immediately ahead."[108] Thus "[p]olicymakers in the 1960s adopted a highly optimistic view of the levels of output and employment that could be reached without triggering inflation," believing "in a long-run trade- off between unemployment and inflation."[109]

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[103] Quoted in Alan Blinder, *Central Banking*, 1999, p. 28
[104] Timberlake, *Monetary Policy*, 1993, pp. 348-361
[105] Blinder, *Central Banking*, 1999, p. 29
[106] A.W. Phillips, "The Relationship between Unemployment and the Rate of Change of Money Wages in the United Kingdom 1861-1957," *Economica*, 25 (100), 1958, pp. 283-299
[107] "[M]any economists and policymakers held the view that policy could exploit a permanent tradeoff between inflation and unemployment, as described by a simple Phillips curve relationship. The idea of a permanent tradeoff opened up the beguiling possibility that, in return for accepting just a bit more inflation, policymakers could deliver a *permanently* low rate of unemployment. This view is now discredited, of course, on both theoretical and empirical grounds." Bernanke, "The Great Moderation," 2004
[108] Samuelson and Solow, "Analytical Aspects of Anti-Inflation Policy," quoted in De Long, 1995, p. 8
[109] Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 20

The new formal models and the estimates that went into them pictured inflation as a low-cost remedy in the fight against unemployment, a means to fulfill the commitment to combat this social ill as embodied by the Full Employment Act of 1946. This fight was given new impetus by President Kennedy (1961-63), who asserted that "[w]e cannot afford to settle for any prescribed level of unemployment."[110] Taking its cues from Keynesian economists, the first *Economic Report of the President* published by the new administration initially targeted an unemployment rate of 4 percent—below what previous policymakers had assessed to be sustainable and non-inflationary.[111]

In the 1950s, unemployment rates at 5 percent or higher were seen as normal. In the 60s, however, FOMC members came to share the beliefs of fiscal policymakers that unemployment hovering between 5 and 6 percent indicated a large degree of unutilized resources, implying that inflation due to excess demand was not a concern. As an example of the optimistic assessments of the time, in its May 1964 meeting, the FOMC assessed nominal GDP growth of 7.5 percent as a "moderate, sustainable pace."[112]

The relation between inflation and unemployment became increasingly unstable as the unemployment rate had a tendency to bounce back after each attempted expansion of the economy through monetary and fiscal stimulus. In his 1968 presidential address before the American Economic Association (AEA), Friedman confronted the conventional wisdom, arguing that attempts at reducing unemployment at the cost of increased inflation would only have, at most, a temporary effect, since rising price growth would change inflation expectations among wage earners, thereby leading to calls for higher nominal wages to catch up with inflation. This would then push real wages (nominal wages adjusted for inflation) back up to the level they were before the last bout of inflation, thereby reestablishing the previous level of unemployment, but now at a higher level of inflation. Friedman concluded: "there is always a temporary trade-off between inflation and unemployment; there is no permanent trade-off."[113]

This analysis led to the notion of a "natural rate of unemployment," a level that neither pushes inflation up, nor down. It would later be referred to as the non-accelerating inflation rate of unemployment (NAIRU). This model of the economy attributes inflationary pressures to employment exceeding its natural level. By implication, inflation can be brought down by

[110] DeLong, "America's Only Peacetime Inflation," 1996
[111] *Economic Report of the President*, 1962; cited in Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 20
[112] *Record of Policy Actions*, May 5, 1964, p. 84; quoted in Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 22
[113] Milton Friedman, "The Role of Monetary Policy: Presidential Address to AEA," *American Economic Review* 68 (1), 1968, pp. 1-17

inducing economic slack, that is, a period in which employment and output is pushed below potential by aggregate demand restraint.

Policymakers quickly adopted the "natural rate" framework. An early indicator was the 1970 *Economic Report of the President* (the first under the Nixon Administration), which stated that "inflations have seldom ended without a temporary rise in unemployment," implying that aggregate demand restraint "should ultimately produce high employment with much less inflation than we have recently experienced." Fiscal policymakers pictured a transition, in which unemployment and inflation might "be higher than would have been desirable if the inflation had not been allowed to persist so long." They concluded that this is "the price we must pay for having long pursued inflationary policies. Once inflation has been set in motion, there is no way of correcting it without some costs."[114]

Thus the new framework led policymakers to believe that changes in inflation were dependent upon the divergence between actual unemployment and the "natural" level. However, the estimates of the natural rate of unemployment went through substantial revisions. Overestimating the sustainable level of output and employment and underestimating the ability of demand restraint to pull down inflation, led to inflation trending upwards throughout the decade and into the next.[115]

As a result, the inflation pessimism among policymakers became more entrenched. Chairman Burns early on came to the conclusion that "the old rules were no longer working." This view was reiterated at the end of the decade, as the President's economic advisors came to believe that "experience has demonstrated that the inflation we have inherited from the past cannot be cured by policies that slow growth and keep unemployment high," concluding that "[e]conomic stagnation is not the answer to inflation." Fed Chairman Miller, who was appointed in 1978, agreed, saying that "an appreciable slowing of inflation would prove more difficult to achieve than previously had been anticipated."[116]

Symptomatically, the Congressional *Joint Economic Report* of 1979 stated that inflation "cannot be dealt with […] through demand restrictions alone without exacting intolerable costs in terms of lost output and high unemployment." Moreover, inflationary pressures were

[114] *Economic Report of the President*, 1970, pp. 21-22; quoted in Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 23
[115] Romer and Romer, *Kansas City Fed Symposium*, 2002
[116] Burns, 1971; *Economic Report of the President*, 1978, p. 17; *Record of Policy Actions*, August 15, 1978, p. 210. Both quoted in Romer and Romer, *Kansas City Fed Symposium*, 2002, pp. 25, 31, 32

in large part attributed to "rising energy and food costs" as well as a host of other factors, including weak productivity gains and a depreciating dollar.[117]

The beliefs of monetary policymakers would change profoundly under the chairmanships of Volcker (1979-1987) and Greenspan (1987-2006), firmly believing in the need to restrain inflation. At the same time, the emergence of a new set of doctrines based on the notion of "rational expectations" would come to influence macroeconomic practitioners and theorists.

The Rational Expectations Revolution

The natural rate framework led to a new focus on expectations among monetary policymakers.[118] Forward-looking behavior on the part of the public plays a central role in this model, because unions base their wage claims on inflation expectations. Thus if inflation exceeds expectations, real wages will be pushed down in the short run (since nominal wage demands will fall behind inflation). If actual inflation falls short of expectations, real wages will tend to trend upwards. Such a dynamic could be characterized as "adaptive expectations" in that the public adjusts their behavior based on recent experience with inflation and macroeconomic policy actions.

Robert Lucas Jr., a Chicago school economist, picked up on Friedman's critique of postwar stabilization policy embodied in the natural rate hypothesis and expanded it into a full theoretical paradigm based on the notion of "rational expectations." In attempting to reconcile macroeconomics with microeconomic theory, he started out from a core assumption of human behavior, namely that people are rational. Extending this analysis to the macro sphere, he came to believe that the public could assess the model of the economy that fiscal and monetary authorities make use of, thus forming expectations on observed policy actions.[119] By implication, policymakers could only pull down unemployment by surprising the public with monetary stimulus exceeding their expectations. This thinking gave rise to the "Lucas critique," which asserted that the macro-econometric models used in policymaking relied upon empirical equations and estimates from periods in which the public had formed certain

[117] *Joint Economic Report*, U.S. Congress, 1979, March 22, p. 45; quoted in Hetzel, *Monetary Policy*, 2008, p. 150

[118] "Expected inflation plays a crucial role in the natural-rate framework: inflation differs from its expected value when employment is different from the natural rate. And, expected inflation, which had been virtually absent from policymakers' discussions during most of the 1960s, suddenly began to play a key role in policymaking at the end of 1968." Romer and Romer, *Kansas City Fed Symposium*, 2002, p. 24

[119] Concise Encyclopedia of Economics, "Robert E. Lucas Jr.,"

expectations about macroeconomic policy. If these expectations changed, due to changes in policy, so would these equations.

Lucas would become the intellectual figurehead of "New Classical" economics. This school of thought questioned most of the central tenets of post-war Keynesianism, and largely discarded notions of market imperfections—such as the Keynesian idea of "sticky" prices and wages.[120] Along with this new thinking, came a skeptical attitude towards the need for government stabilization policies.

When Lucas and his New Classical comrades-in-arms launched the "rational expectations revolution" in the late 1970s, they did so by fervently attacking Keynesianism. In a 1978 paper titled "After Keynesian Macroeconomics," Lucas and Thomas J. Sargent triumphantly wrote: "That the predictions [of Keynesian economics] were wildly incorrect, and that the doctrine on which they were based was fundamentally flawed, are now simple matters of fact." The task confronting "contemporary students of the business cycle," then, was to sort through the "wreckage" to see "what features of that remarkable intellectual event called the Keynesian Revolution can be salvaged" and "which others must be discarded."[121] To add insult to injury, Lucas and Sargent further denigrated the Keynesian paradigm by questioning whether the theory had any scientific foundations at all: "For policy, the central fact is that Keynesian policy recommendations have no sounder basis, in a scientific sense, than recommendations of non-Keynesian economists or, for that matter, noneconomists."[122]

Looking back at these developments, Olivier Blanchard described the discipline as a "battlefield." However, in spite of the vitriol of the late 70s and early 80s, the main idea of the New Classical "assault"—rational expectations—was widely accepted by the economics profession, including a new generation of economists that wished to revive some of the basic assumptions of Keynesianism, at the same time incorporating the critique by Lucas and other New Classicals. Keynesian and New Classical economics were fused into a new set of thought—a synthesis named "New Keynesian" economics.

A major area of contention between the two emerging main strands of macroeconomics was whether the economy, on a macro level, was inherently unstable, and thus in need of government intervention. In line with Keynes' critique of the capitalist system as inherently

[120] By "sticky" prices and wages is meant that prices of goods, services and labor has a tendency to only slowly readjust upwards or downwards (especially downwards) in the face of changes in spending in the economy. Furthermore, if wages falls slower than the prices of goods and services, this will drive up real wages, thus creating temporary unemployment.
[121] Robert E. Lucas, and Thomas J. Sargent (1978), "After Keynesian Macroeconomics," quoted in Olivier J. Blanchard, "The State of Macro," NBER Working Paper 14259, 2008, p.3
[122] Robert E. Lucas Jr. and Thomas J. Sargent (1979), "After Keynesian Macroeconomics," quoted in Mankiw, "The Macroeconomist as Scientist and Engineer," 2006, p. 35

unstable and prone to below potential performance in the absence of the guiding hand of the authorities, New Keynesians came to regard the economy as characterized by certain imperfections, even though they tended to have a more optimistic outlook on its overall performance. New Classicals, on the other hand, would downplay such imperfections, at the same time stressing the shortcomings of government macro interventions.

New Keynesian thought and policy prescriptions became the prevailing wisdom among would-be economic "engineers"—those looking to influence macroeconomic policy during the Great Moderation. According to N. Gregory Mankiw, a self-styled New Keynesian, these economists were "by temperament, more inclined to become macroeconomic engineers than were the economists working within the new classical tradition."[123] He adds that, to his knowledge, no New Classical economist ever left academia to pursue a career in public policy. By contrast, several influential New Keynesians entered into public service, including Larry Summers (former Treasury Secretary), John B. Taylor (former Under Secretary of the Treasury), Richard Clarida (former White House economic advisor)—not to mention Ben Bernanke (former Fed Governor, now Fed Chairman), Olivier Blanchard (Chief Economist of the IMF) and Mankiw himself (former Chairman of the Council of Economic Advisers).

Even though many New Keynesians found their way into high-ranking positions within the federal government, including the Federal Reserve, it has been argued that the application of New Keynesian models to actual policy-making was somewhat limited. According to Alan Blinder, the Fed continued to rely upon traditional Keynesian models.[124] Mankiw thinks the same could be said of fiscal policymakers and concludes that business cycle theorizing by contemporary schools of thought "has had close to zero impact on practical policymaking."[125] This could be pushing the argument a bit too far. After all, formal models are not all that matters within policymaking. The historical record suggests that the core idea of rational expectations had a profound impact on how monetary policymakers think. This was the main lesson learned from the wage-price spiral of the 1970s. By looking at the development of actual policy models, it would seem that Mankiw misses the mark even in a formal sense. The FRB/US model, developed in the mid-90s, makes extensive use of the theoretical contributions by New Keynesians and New Classicals.[126] "A key feature of the new model is

[123] Mankiw, "The Macroeconomist as Scientist and Engineer," 2006, p. 37
[124] William White, "Modern Macroeconomics Is on the Wrong Track," *Finance and Development*, IMF, 2009; Olivier J. Blanchard, "The State of Macro," *NBER Working Paper*, no. 14259, 2008
[125] N. Gregory Mankiw, "The Macroeconomist as Scientist and Engineer," 2006, p. 40
[126] Michael Woodford, "Convergence in Macroeconomics: Elements of the New Synthesis," paper prepared for annual meeting of the American Economics Association, New Orleans, January 4, 2008

that expectations of future economic conditions are explicit in many of its equations."[127] Other central banks have followed in the same direction.[128] Moreover, speeches by leading Fed officials are ripe with references to recent research literature. For example, in a speech emphasizing the "science of monetary policy," Fed Governor Frederic S. Mishkin told a group of economics students at MIT that the "key element of the macroeconomics revolution in recent decades has been the recognition that the dynamic structure of the economy is not purely mechanistic but instead reflects the *fundamental role of expectations* in the economic decisions of households and firms."[129] (Emphasis added.)

On a practical level, this thinking gave rise to the idea of inflation targeting, a means by which the government attempts to manage the inflation expectations of the public. The stabilization of inflation expectations through what central bankers referred to as a "nominal anchor" was seen as both the central goal and the most important achievement of central banks during the Great Moderation.[130] Price stability, or constant and moderate inflation, was in turn seen as a prerequisite for achieving stability in output and employment.

The monetarist emphasis on the importance of monetary policy became a staple belief among the economics profession, though not in the way Friedman had envisioned. At the center of monetarist thought was a firm belief that "money matters," stressing the need to monitor and control monetary aggregates to stabilize prices and dampen the business cycle, preferably through a "monetarist" rule. This basic tenet was discarded and replaced by the looser notion of "monetary policy matters" as the forming consensus centered upon the policy rate of the central bank as the main tool of conducting stabilization policy.[131]

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[127] Flint Brayton, Eileen Mauskopf, David Reifschneider, Peter Tinsley, and John Williams, "The Role of Expectations in the FRB/US Macroeconomic Model," *Federal Reserve Bulletin*, April, 1997, p. 227

[128] Examples of policy models that are similar to the FRB/US model can be found in the Bank of Canada's Quarterly Projection Model and the Reserve Bank of New Zealand's Forecasting and Projection System. See Donald Coletti *et al.*, "The Dynamic Model: QPM, the Bank of Canada's New Quarterly Projection Model, Part 3," Bank of Canada Technical Report no. 75, 1996; Richard Black *et al.*, "The Forecasting and Policy System: The Core Model," Reserve Bank of New Zealand Research Paper no. 43, 1997—cited in Woodford, 2008

[129] Frederic S. Mishkin, "The Federal Reserve's Enhanced Communication Strategy and the Science of Monetary Policy," speech given to the Undergraduate Economics Association, Massachusetts Institute of Technology, Cambridge, Massachusetts, November 29, 2007

[130] In the jargon of monetary economists, "an inflation target serves as a *nominal anchor* for monetary policy. In doing so, it provides a focus for the expectation of financial markets and the general public as well as a reference point against which central bankers can judge the desirability of short-run policies." Ben S. Bernanke, Thomas Laubach, Frederic Mishkin and Adam Posen, *Inflation Targeting: Lessons from the International Experience*, Princeton University Press, 1999

[131] Michael Woodford writes: "Monetary policy is now widely agreed to be effective, especially as a means of inflation control. […] In this respect, the monetarist school has won an important debate with the postwar Keynesians." However, New Keynesians view other factors as important proximate causes of short-term changes in the general price level. Thus the "Phillips curve is alive and well" in New Keynesian models. Moreover, "accepting that monetary policy is the ultimate determinate of the

Monetary policy was identified as a more potent tool for influencing the business cycle and real variables such as output and employment in the short run than traditional post-war Keynesian fiscal remedies. Interest rates can be cut on short notice and without the potential political pitfalls and duress that accompany budgetary appropriations, a realization that dawned upon activist economists during this period.[132] Former Clinton Treasury Secretary Lawrence Summers succinctly summed up the new consensus:

> "Fierce debates continue about how the Federal Reserve Board and other central banks should set monetary policy. But the debates take place within the context of nearly complete agreement on some basics: Monetary policy can shape an economy more than budgetary policy can; extended high inflation will not lead to prosperity and can lead to lower living standards; policy makers cannot fine-tune their economies as they fluctuate."[133]

Thus Friedman's principle legacy was threefold: First, he put expectations on center stage within macroeconomic thought. Second, he convinced policymakers and economic "engineers" that monetary policy was the most effective tool to influence real variables such as output and employment in the short-run. Third, he convinced central bankers that the Great Depression could have been mitigated if the Fed had followed an expansionary policy in the early 1930s. These three core beliefs came to play an important role in the development of the Fed's monetary doctrines during the Great Moderation.

The evolving doctrines and practices, influenced by the intellectual response to the Great Inflation as well as to unfolding events during the Great Moderation, will be the topic of the next three chapters. However, a brief discussion of the Federal Reserve's legal mandate and how it has evolved through time is necessary to gain some understanding of the institutional context within which policy is formulated and implemented.

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general level of prices" does not mean that "it is necessary to understand prices as being determined by the quantity of money, and still less that inflation control requires careful monitoring of measures of the money supply." (Emphasis in original.) Michael Woodford, "Convergence in Macroeconomics: Elements of the New Synthesis," paper prepared for the annual meeting of the American Economics Association, New Orleans, January 4, 2008, pp. 11-12

[132] One reason for this newfound skepticism towards traditional Keynesian remedies was concerns about the efficacy as well as disturbing political influences in the conduct of fiscal policy. There arose "concerns about lags and political influences in the design and implementation of fiscal policy; and the need to stabilize and reduce typically high debt levels"; Olivier Blanchard, Giovanni Dell'Ariccia, and Paolo Mauro, "Rethinking macro policy," Vox, 2010

[133] Summers quoted in David Warsh, "It Isn't All in Adam Smith," economicprincipals.com, 2006

The Fed's Dual Mandate

The Federal Reserve System was established through law in 1913. Since then its legislative mandate has changed several times during its near one century of existence. The original stated goal was to maintain an "elastic currency" to ensure a sufficient supply of liquidity to smooth out the seasonal fluctuations in the demand for money, as well as function as a "lender of last resort" in order to stave off banking panics.[134] In the following decades, the newly created monetary authority was put to the test.

During the financial crisis and severe downturn following the crash of 1929, the Fed was unable to prevent a severe monetary contraction, or effectively fulfill its role as lender of last resort. The monetary contraction led to a rapid fall in output and employment. In 1933, gross domestic product (GDP) was more than 30 percent below its 1929 level. The unemployment rate reached 25 percent and stayed at a high level all the way up to the Second World War.[135]

The persistent high unemployment rates of the 1930s led to a reorientation of economic policy. The fight against unemployment was now seen as *the* most important task facing the authorities when it came to domestic economic policy. This goal was stipulated in the Full Employment Act of 1946. Even though this piece of legislation did not mention the Fed specifically, it required the federal government to foster "conditions under which there will be afforded useful employment opportunities […] for those able, willing, and seeking to work, and to promote maximum employment, production, and purchasing power."[136]

However, the term "full employment" is rather vague and, as such, can be interpreted to mean either a commitment to counteract drops in employment, to avoid what happened in the 1930s, or a commitment to push the unemployment rate down to very low levels through expansionary measures, as was done in the 1960s and 70s. As noted, the major shift in policymaking was introduced with the Kennedy-Johnson Administration (1961-69). Consistently overestimating sustainable output and employment and underestimating how policy affected inflation led to policy mistakes during the 60s and 70s. The stagflation and Great Inflation that followed what could be seen as an over-ambitious interpretation of the employment mandate led to revisions of the macroeconomic goals, which were captured in the 1977 amendment to the Federal Reserve Act. The new mandate of the Fed stated that it "shall maintain long run growth of the monetary and credit aggregates commensurate with the

[134] Federal Reserve Bank of San Francisco, "The Goals of U.S. Monetary Policy," *FRBSF Economic Letter*, 99-04, January 29, 1999
[135] N. Gregory Mankiw, "The Economist as Scientist and Engineer," 2006, p. 30
[136] Quoted in Federal Reserve Bank of San Francisco, 1999

economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."[137]

The goal of full or "maximum employment" remained. However, with the 1970s inflationary experience in mind, the interpretation of this goal changed to one in which "full employment" was explicitly defined as the employment level "commensurate with the economy's long run potential to increase production," that is, with the assumed long-term sustainable growth path of the economy. Moreover, "promoting full employment can be interpreted as a countercyclical monetary policy in which the Fed aims to smooth out the amplitude of the business cycle."[138] Thus, this goal can be understood as a mandate to stabilizing short-term fluctuations in output. In addition to this output goal, the central bank was explicitly given the mandate to ensure "stable prices," a reflection of the unpleasant experience with the Great Inflation. The third goal listed in the 1977 legislation was "moderate long-term interest rates." However, this is implied by the goal of stable prices, since moderate price growth (low inflation) also entails low nominal interest rates. The Fed was thereby in effect given a "dual" mandate, to pursue price and output stability.

Monetary policymakers came to believe that the stabilization of the year-on-year growth in consumer prices and the "anchoring" of inflation expectations to that target was the best way to achieve the goal of output stabilization. As witnessed by Vice Fed Chairman Donald Kohn's comments on the subject in the opening quote of this chapter, the objective for the Fed is "to promote maximum sustainable employment and stable prices over time," two goals that are intimately linked in theory and practice because "promoting price stability" will "contribute to maximum employment and growth over time by eliminating the uncertainties and distortions of high and unstable inflation."[139]

The new understanding of the government's macroeconomic goals was further confirmed in the Full Employment and Balanced Growth Act of 1978, also named the Humphrey-Hawkins Act after its main sponsors. This piece of legislation mandates the federal government to "promote *full employment and production*, increased real income, balanced growth, a balanced Federal budget, adequate productivity growth, proper attention to national priorities, achievement of an improved trade balance […] and *reasonable price stability*."[140] (Emphasis added.)

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[137] Federal Reserve Bank of San Francisco, 1999
[138] Federal Reserve Bank of San Francisco, 1999
[139] Donald L. Kohn, "Monetary Policy in the Financial Crisis," in John D. Ciorciari and John B. Taylor (eds.), *The Road Ahead for the Fed*, Hoover Institution Press, 2009, p. 52
[140] Federal Reserve Bank of San Francisco, 1999

The legislation on "price stability" did not specify a target range for inflation. In contrast to several other industrial countries, there is no formalized target for the U.S. inflation rate. However, there seemed to be an informal target around 2 percent, even though there has been some academic debate on whether the Fed has implicitly conducted policy with such a target in mind.[141] The other stated goal, that the central bank should move to stabilize the level of output, is usually expressed by the so-called "output gap." This gap is any deviation from the long-term "trend" growth of GDP, assumed to be the optimal and sustainable rate of growth for the economy.

If the level of economic activity is too high, there is a positive output gap. If in addition inflation is anticipated to exceed 2 percent, the central bank is expected to tighten monetary policy by raising interest rates and halting money growth. Conversely, if expected price inflation falls below the stated target and employment and output levels are too low—a negative output gap—the central bank is expected to ease in order to stimulate the economy back to its assumed sustainable levels of output, employment and inflation.

The optimal weight given to the two targets—the inflation target and output target—is formalized in the "Taylor rule," which offers guiding principles for how the monetary policy rate (the fed funds rate) should move up or down in response to deviations of inflation and output from the desired levels.[142] In response to inflation, the fed funds rate should move faster than the inflation rate to make sure that the "real" fed funds rate (the interest rate adjusted for inflation) is in fact raised—the so-called "Taylor principle."[143]

This principle was not followed by the FOMC in the 1970s, leading to accelerating inflation. With Volcker came a more proactive stance towards inflation. In order to "break that cycle," the chairman stressed the "need to change expectations" and establish a "credible and disciplined monetary policy."[144] His successor Alan Greenspan would take this challenge seriously, pushing policy towards the yet unattained goal of "price stability."

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[141] Central bank historian Marvin Goodfriend argues that Fed policy evolved into an "implicit" inflation target, at the same time advocating that this implicit target being formalized, thereby becoming "explicit." Governor Donald L. Kohn disagreed: "I do not believe that inflation targeting, in any meaningful sense of that term, describes what the Federal Reserve has been doing over the last twenty years." Bernanke thinks that the Fed has been committed to low and stable inflation, which, some would say, could be seen as a form of "implicit" targeting, depending on how Fed officials define "low and stable inflation." Donald L. Kohn "Comments on Marvin Goodfriend's 'Inflation Targeting in the United States'," remarks at the National Bureau of Economic Research Conference on Inflation Targeting, Bal Harbour, Florida, January 25, 2003

[142] John B. Taylor, "Discretion versus policy rules in practice," Carnegie-Rochester Conference Series on Public Policy 39, 1993, pp. 195-214

[143] Bernanke, "The Great Moderation," 2004

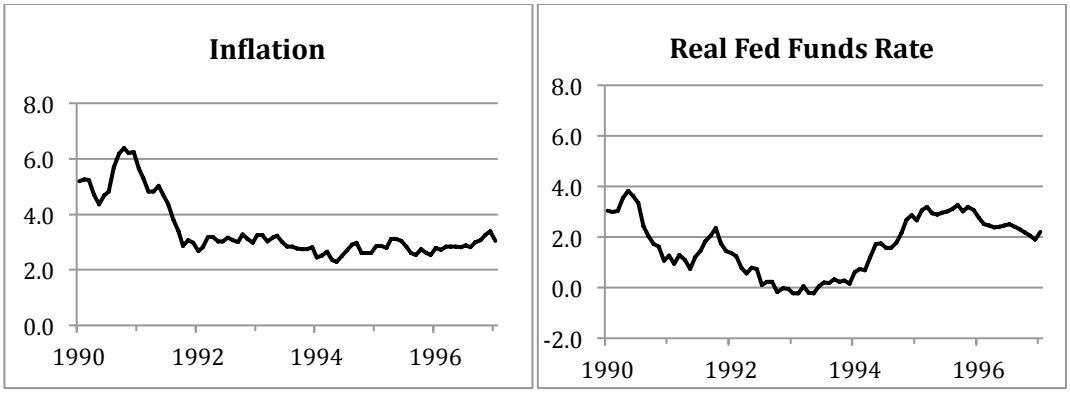
[144] Paul Volcker, "Remarks," before the National Press Club Washington, D. C., January 2, 1980, p. 11

4. FEAR OF INFLATION: THE GREAT MODERATION

> "The long-run costs of a return to higher inflation and the risks of this occurring under current circumstances are sufficiently great that Federal Reserve policy at this juncture might be well advised to err more on the side of restrictiveness rather than stimulus."[145]
>
> —Alan Greenspan (1988)

The Greenspan FOMC seemed determined to establish its inflation-fighting credentials, first through raising rates in 1989 in an attempt to cool down the economy, then in the early 1990s by only slowly responding to an economic recession, and lastly, in 1994, by moving against inflationary pressures even before a rise in inflation made itself visible. This last move earned the label "preemptive strike."[146] Inflation rates did come down, from around 6 percent at the end of 1990, stabilizing at around 3 percent from 1992 to 1996. The nominal fed funds rate adjusted for inflation (the real rate) went through two significant swings from mid-1990 to late 1995. (See figure 4.1.)

Figure 4.1 (a-b) The Greenspan Disinflation and Price Growth Stabilization, 1990-96



Source: St. Louis Fed, FRED; Author's Calculations (CPIAUCNS, FEDFUNDS)

This chapter will explore some of the developments underlying the observed movements of these indicators, as well as the beliefs informing Fed practices during the first decade of the Greenspan FOMC.

[145] *Chicago Tribune*, "Fed Watchful, But In No Rush To Raise Rates," July 14, 1988
[146] Hetzel, *Monetary Policy*, 2008, p. 204

The Primacy of Price Stability

Greenspan was appointed Fed Chairman by President Reagan in the summer of 1987, confirmed by the Senate on August 3 and sworn in on August 11. His first policy inclination was to tighten. He pushed for an increase in the discount rate, from 5.5 to 6 percent, in order to "subdue inflationary pressures."[147] Shortly thereafter, a major stock market sell-off led Fed policymakers to conduct sizeable open market operations to "assure adequate liquidity" in the face of volatile financial markets.[148] In the ensuing months, FOMC members agreed that circumstances pointed to weaker economic growth and "a lower risk of any substantial pickup in inflation."[149]

The following year was "a challenging one for monetary policy," according to Greenspan. Uncertainties about the impact of the stock market crash on activities in the financial sector and the economy at large led Fed policymakers to increase "the availability of bank reserves slightly further" and to monitor "financial and economic indicators closely for any signs that the economic expansion was faltering." Gradually, it became clear that "the economic expansion remained well on track and that the balance of risks was shifting in the direction of higher inflation."[150]

In other words, once financial stress subsided, concerns with inflation returned. In his February 1988 Humphrey-Hawkins statement, Greenspan stressed the "formidable challenges" ahead in "meeting national economic goals of sustaining growth and progress toward price stability." He expressed support of the Fed's dual mandate, emphasizing the "focus on maintaining the economic expansion and on progress toward price stability" seen as a "necessary condition for long-term sustained economic growth."[151]

The *Monetary Policy Report* of February 1989, reaffirmed the Fed's commitment to "contain inflationary pressures," reflected in FOMC decisions to "lower the ranges for monetary and credit expansion" that year. M2 growth ranges was reduced by a full percentage point from the year before, "signaling the Committee's determination to resist any upward tendencies in inflation in the coming year and to promote progress toward price stability over the long run."[152] The growth rates of both base money and M2 decelerated from mid-1988 and well into 1989 before trending upwards again, as shown in figure 4.2.

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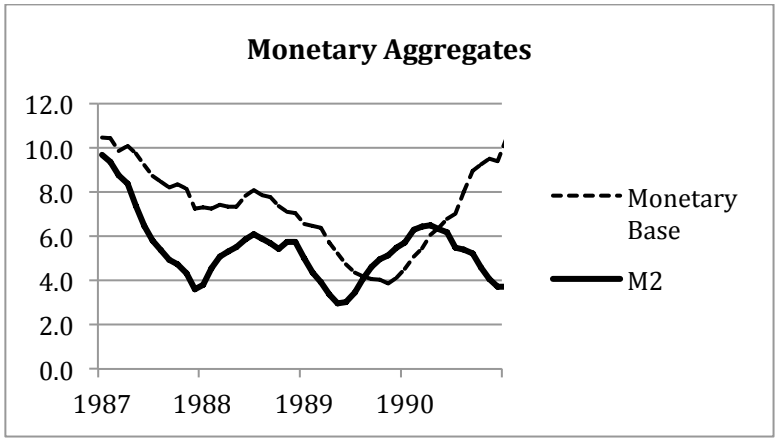
[147] As explained in his memoirs; Greenspan, *Age of Turbulence*, 2007, pp. 103-104
[148] *Record of Policy Actions*, November 3, 1987, p. 5-6
[149] *Record of Policy Actions*, November 3, 1987, p. 9
[150] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1989 (1), p. 34
[151] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1988 (1), p. 26
[152] *Monetary Policy Report*, *Humphrey-Hawkins*, 1989 (1), p. 9

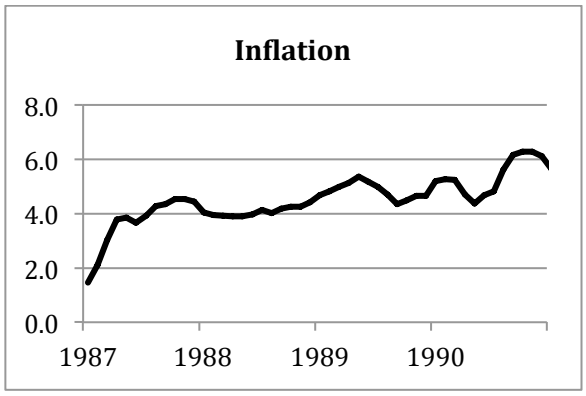
Figure 4.2 Monetary Base and M2 Growth, 1987-1990



Source: St. Louis Fed, FRED (BOGUMBNS, M2NS; % change from a year ago)

In February 1989, Greenspan was concerned that the economy was running close to its potential, increasing the risks of price pressures. In these circumstances, the Fed remained "more inclined to act in the direction of restraint than toward stimulus." He told Senate committee members that "the current rate of inflation, let alone an increase, is *not acceptable*, and our policies are designed to reduce inflation in coming years."[153] (Emphasis added.) Inflation was at this point exceeding four percent and trending upwards.

Figure 4.3 The Greenspan Inflation, 1987-1990



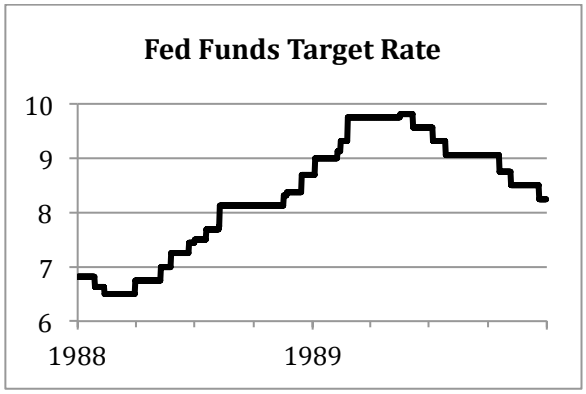
Source: St. Louis Fed, FRED (CPIAUCNS, % change from a year ago)

Greenspan warned that policy actions aimed at reducing inflation "will involve containing pressures on our productive resources and, thus, some slowing in the underlying rate of growth of real GNP is likely in 1989."[154] In other words, aggregate demand restraint was necessary to counter inflationary pressures. Such restraint was orchestrated by putting pressure on reserve positions, that is, tightening conditions in the market for reserve balances and raising the federal funds rate. Between March 1988 and May 1989, the FOMC raised the

[153] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1989 (1), p. 35
[154] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1989 (1), p. 35

rate in several steps, from 6.5 percent to 9.8125 percent (see figure 4.4). The fed funds rate was raised faster than the inflation rate, ensuring that the real fed funds rose as well.

Figure 4.4 Monetary Policy Rate, 1988-1989



Source: St. Louis Fed, FRED (DFEDTAR)

The Natural Rate Framework of the Greenspan Fed

These policy actions, and the reasoning behind them, affirm the natural rate framework, pointing to the potency of monetary policy in restraining aggregate demand: "In the short run, demands can fall short of or run ahead of available resources. Monetary policy can assist in bringing about a better match between demand and potential supply and thereby contribute to aggregate price stability."[155] This approach was consistently applied when assessing ongoing economic developments in FOMC policy deliberations. A mainspring of this framework is the notion that economic activity fluctuates around a long-run sustainable level, given "available resources" and a certain level of productive capacity. When pushing demand beyond this level, adverse consequences can arise:

> "When the economy is operating below capacity, bringing demand in line with supply can involve real GNP growth that is faster for a time than its long run potential. But when the economy is operating essentially at capacity, monetary policy cannot force demand to expand more rapidly than potential supply without adverse consequences. Such an attempt will result in accelerating prices and wages, as producers bid for scarcer, and at the margin less productive, labor and capital. Over time it would result in little, if any, additional output."[156]

This way of thinking was apparent among macroeconomic policymakers in this period.[157] However, in the early 1990s, revisions were made by the Fed, reflecting changing economic circumstances. Historical experience seemed to suggest that the behavior of inflation "depends not only on the amount of slack remaining in labor and product markets, but on

[155] Greenspan, "Statement," *Humphrey-Hawkins*, 1989 (1), p. 35
[156] Greenspan, "Statement," *Humphrey-Hawkins*, 1989 (1), p. 35
[157] Romer and Romer, *Kansas City Fed Symposium*, 2002, pp. 33-36

other factors as well, including the rate at which that slack is changing." In his July 1993 Humphrey-Hawkins statement, Greenspan explained that when the economy is moving rapidly towards capacity, even though capacity has not yet been reached, "temporary bottlenecks emerge" that can push up prices. Moreover, "workers and producers raise wages and prices in anticipation of continued strengthening in demand."[158]

These amendments to the basic model were based on observed behavior of economic indicators at the time. Notably, "some of the readings on inflation" were "disturbing." Greenspan noted that coming out of the 1991 recession "prices might be accelerating despite product market slack and an unemployment rate noticeably above estimates of the so-called 'natural' rate of unemployment—that is, the rate at which price pressures remain roughly constant." In the past, he held, "the existing degree of slack in the economy had been consistent with continuing disinflation." In other words, the economic model was in need of revision due to the changing nature of the American economy. Such an approach to modeling and policymaking has been characteristic of the Greenspan Fed. In the words of Alan Blinder, who served as Fed Vice Chairman in the mid-90s, "Greenspan never has accepted the idea that any model with unchanging coefficients, or even with an unchanging structure, can describe the U.S. economy adequately. Rather, he sees the economy as in a state of constant flux, and he sees the central bank as constantly in learning mode."[159]

Such an approach to understanding the economy seems reminiscent of the interwar institutionalism of Wesley C. Mitchell and his empirical business cycle research. In 1997, Greenspan explicitly pointed to these influences: "There are certain principles, and certain *empirical regularities* in behavioral relations, that we can follow with some degree of confidence." Many of these relationships are "embedded in the traditional notion of the business cycle developed by Wesley Clair Mitchell" and worked out with Arthur Burns, who became Fed Chairman in the 1970s. "Their insights remain relevant today."[160] Though there were "empirical regularities," that could be followed, "each cycle tends to have its own identifying characteristic." Thus forecasting must face an ever-changing economic structure as well as institutional changes impacting the behavior of the economy. One such change, making its mark on the U.S. economy of the 1980s and early 1990s, emanated from reforms of the regulatory framework for the financial services industry, especially depository institutions. These developments would have wide-ranging implications for monetary policy.

[158] Alan Greenspan, "Testimony," *Humphrey-Hawkins*, 1993 (2), p. 62
[159] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 17
[160] Alan Greenspan "Performance of the U.S. economy," Testimony before the Committee on the Budget, United States Senate, January 21, 1997

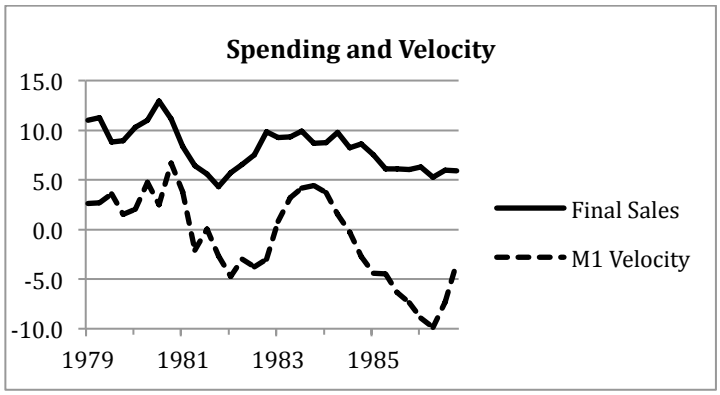
Abandoning the Monetary Aggregates

Early on, Greenspan commented upon the uncertainties surrounding the monetary targets the FOMC was supposed to focus on, saying that "innovation and deregulation has affected the behavior of the monetary aggregates in a number of ways," only some of which the monetary authorities fully understood. Thus the behavior of the aggregates seemed to have introduced more "noise" in the relationship between money and spending.[161]

One origin of this "noise" was the Depository Institutions Deregulation and Monetary Control Act (DIDMCA), enacted in 1980, which led to significant changes in the institutional makeup of U.S. financial markets, in turn affecting the behavior of the monetary aggregates. By allowing banks to freely set interest rates on deposits, the public could choose to hold more of their wealth in demand deposits rather than short-term financial instruments. Moreover, the ratio of demand deposits to currency, that is, how much money people held in the form of cash and how much they chose to hold in checking accounts, changed as well.[162] As a result, both the supply and velocity of M1 went through large swings, making it hard to predict how changes in the monetary base—the only component of the money supply directly controlled by the Fed—would impact the wider money supply, let alone the overall level of spending.

In the first seven years after DIDMCA was passed into law, M1 velocity mostly trended downwards. Nominal spending, as measured by final sales of domestic products, decelerated during the Volcker-induced recession at the start of the decade, and then again in the second half of the decade, alongside falling M1 velocity, as seen in figure 4.5.

Figure 4.5 M1 Velocity and Nominal Spending, 1979-1987

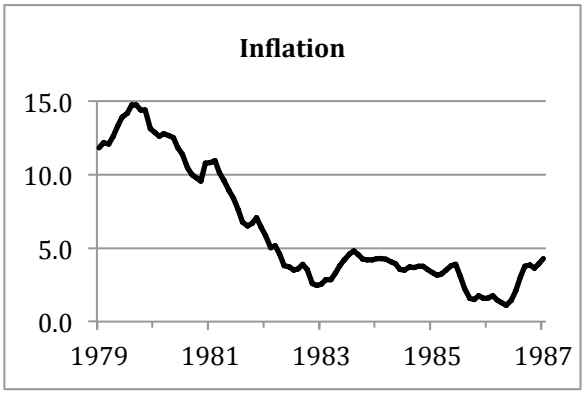


Source: St. Louis Fed, FRED (FINSAL, M1V; % change from a year ago)

[161] Greenspan, "Testimony," *Humphrey-Hawkins*, 1988 (1), p. 24
[162] Timberlake, *Monetary Policy*, 1993, p. 375

Volcker has been attributed with ending inflation through consistent monetary tightening. However, when looking at M1 figures, it would seem that the monetary aggregates did much of the job for him. By trending downwards, M1 velocity would dampen the growth in overall spending, thus putting a break on inflationary pressures. The main driver of these developments seems to be the financial deregulation of the early 1980s, changing the public's behavior. In result, inflation rapidly trended downwards, as can be seen in figure 4.6.

Figure 4.6 The Volcker Disinflation, 1979-1987



Source: St. Louis Fed, FRED (CPIAUCNS, % change from a year ago)

Volcker did not comment upon the causal connections between falling velocity and DIDMCA.[163] The Greenspan FOMC seemed more aware of these connections. Writing in 1989, FOMC Secretary Donald Kohn commented upon how the Fed had changed "the weight that is placed on money and credit measures in the conduct of policy," reflecting "important underlying developments in financial markets," notably "changes in markets for deposits and other financial assets wrought by innovation and deregulation in the 1980s." Domestic deregulation would combine with freer international capital flows to create circumstances in which, "the boundaries around specific collections of financial instruments have become increasingly arbitrary, and monetary or credit aggregates, however carefully delineated, are less likely to be stably related to spending or income."[164]

These developments made the monetary aggregates less reliable for policy purposes. However, the Humphrey-Hawkins Act of 1978 explicitly mandated the Fed to target money growth. This piece of legislation requires the central bank to "maintain long-run growth of the monetary and credit aggregates commensurate with the economy's long-run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."[165] It also requires that the Fed reports its target

[163] Timberlake, *Monetary Policy*, 1993, p. 379
[164] Donald L. Kohn, "Policy Targets and Operating Procedures in the 1990s," *Kansas City Fed Symposium*, 1989, pp. 130, 132
[165] The act quoted in Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), p. 17

ranges for money growth twice every year to Congress. Still, the Greenspan FOMC dropped the target range for M1 in 1987.[166]

The growth ranges for the broader measures of the money supply, M2 and M3, played some role until 1992. In that year, the FOMC took note of "the substantial uncertainties regarding the relationships between income and money […]" Nominal income had proceeded at a faster pace than the monetary aggregates, leading Greenspan to ask: "What accounts for this unusual behavior? Why is it that our financial system was able to support 5½ percent growth in nominal GDP with only 2 percent growth in M2 and ½ percent growth in M3?" He found part of the answer in developments taking place in financial markets, more specifically the acceleration of a "long-standing process of rechanneling credit flows outside of depository institutions." The increased use of capital markets for raising funds among borrowers and the tendency for savers to place their funds outside of deposit-taking banks, had led to a rapidly changing financial landscape. As a result, "the relationship between money and the economy may be undergoing a significant transformation."[167]

In line with its legal mandate, Greenspan assured Senate committee members that the Fed would continue to pay "substantial attention to developments in the money supply," though stressing that "[s]electing ranges for monetary growth over the coming year consistent with desired economic performance, however, is especially difficult when the relationship between money and income has become uncertain." He concluded that the FOMC "necessarily has given less weight to monetary aggregates in the conduct of policy and has relied on a broad range of indicators of future financial and economic developments and price pressures."[168]

In effect, Greenspan was abolishing monetary targets altogether, even though the Fed, in line with its formal mandate, continued to report monetary targets to Congress as an "empty ritual," in the words of Alan Blinder.[169] Financial deregulation played a major part in these developments, both in bringing down inflation during the Volcker years as well as convincing monetary policymakers of the futility of targeting monetary aggregates. Moreover, the wide-ranging changes to the financial landscape played into another major development, which would have a major impact on policymaking, namely the evolving U.S. banking crisis, escalating towards the end of the 1980s.

[166] Blinder, *Central Banking*, 1999, p. 29
[167] Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), p. 57
[168] Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), p. 19
[169] Blinder, *Central Banking*, 1999, p. 9

The Balance Sheet Recession

The Great Inflation had several consequences for the workings of the U.S. economy and its financial markets, not the least for the country's thrift institutions, also called savings and loan associations (S&Ls). These were small, local (non-commercial) banks depositing people's savings and making mortgages. Their postwar business model was simple; they paid 3 percent interest on deposits, which were insured by the Federal Savings and Loans Insurance Corporation, and took 6 percent interest on mortgages, which were of the fixed rate, 30-year kind.

Regulations put interest rate caps on deposits. As inflation rose above these caps, people took their money elsewhere, leading to large-scale disintermediation in the mortgage industry. Moreover, high inflation squeezed the profit margins of the thrifts, which were stuck with long-term assets (mortgages) with a fixed interest rate falling behind the inflation rate. By the time the Volcker Fed started initiating measures to pull down inflation, hundreds of S&Ls were facing insolvency. Congress intervened, passing two financial reform bills aimed at helping the thrift industry. S&Ls were now allowed to set interest rates freely and engage in a wide range of loan activities, of which they had little experience.

Paul Krugman cites the S&L episode as a "classic example" of moral hazard: "because depositors in thrifts were guaranteed by FSLIC, they had no incentive to police the lending of the institutions in which they placed their money; since the owners of thrifts did not need to put much of their own money at risk, they had every incentive to play a game of heads I win, tails the taxpayer loses."[170] Forbearance towards insolvent institutions spawned a situation in which bankers were incentivized to gamble their way out of insolvency, having nothing to lose. Congress and the administration, in their effort to help the thrift industry, unintentionally encouraged such activities, leading to a decade of unsound practices and several cases of outright fraud. By the time Greenspan took over as Fed Chairman, large-scale banking problems were coming to the surface.[171]

In the end, the banking crisis led to extensive losses, some of which were shouldered by taxpayers. At the same time, households and businesses faced substantial losses from falling assets prices, such as depreciating houses and construction ventures gone sour. This, in turn, created a situation that could perhaps be described as a "balance sheet recession."[172]

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[170] Paul Krugman, "What Happened to Asia", January 16, 1998
[171] Some of these developments are described in Greenspan, *The Age of Turmoil*, 2007, pp. 114-17
[172] The term was coined to describe economic developments in Japan. Richard C. Koo, *The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession*, John Wiley and Sons, 2009

The recession of 1990-91 contained unfamiliar elements, creating widespread uncertainties among market participants as well as monetary policymakers. Greenspan pointed to the unusual circumstances facing the economy, including "record debt burdens, overbuilding in commercial real estate, and a substantial cutback in defense spending." Monetary policy actions were trying to respond to these developments, though substantial impediments to growth made this a hard task for the FOMC, among which "balance sheet restructuring" was "perhaps the most important" factor.[173]

Greenspan noted that in the 1980s, "debt growth, hand in hand with rising asset prices, considerably exceeded that of income, and debt burdens rose to record levels." Between 1984 and 1990 around $600 billion in corporate equity was replaced by debt. At the same time, mortgage debt on existing homes increased close to $700 billion as households "endeavored to leverage the equity in their homes, the prices of which seemed to be on a permanent uptrend." Moreover, tax legislation along with increased demand for office space and building structures in a burgeoning service economy, led to "a rapid rise in commercial property asset prices and commercial construction, financed largely by debt."[174]

The balance sheet recession scenario entails a period of leveraging and rising asset prices, followed by an asset bust, impairing the balance sheets of households and firms, in the end leading to a protracted period of debt repayment and sluggish growth. Greenspan pointed to the "difficulties faced by borrowers in servicing their debts as the expansion slowed and the leveling out or decline in asset prices prompted many to cut back expenditures and divert abnormal proportions of their cashflows to debt repayment." Such developments tend to slow down the growth rate of the economy as spending drops, putting downward pressures on aggregate demand. At the same time, financial institutions faced "impaired equity positions" due to "sizable loan losses" combined with a newfound regulatory stringency. In result, lenders limited the availability of credit, adding another impediment to growth.[175]

The debt dynamics underlying balance sheet recessions are of great importance for the efficacy of monetary policy. When household and corporate balance sheets are damaged due to falling asset prices and high debt burdens, so that they in effect end up with negative equity, the public shifts into "debt minimization" mode, paying down debt, rather than taking out new loans.[176] The monetary transmission mechanism, by which the central bank is trying to influence its policy goals, mainly works through the banking system. By extending credit, the banks provide most of the wider money supply, which consists of "deposit currency" on

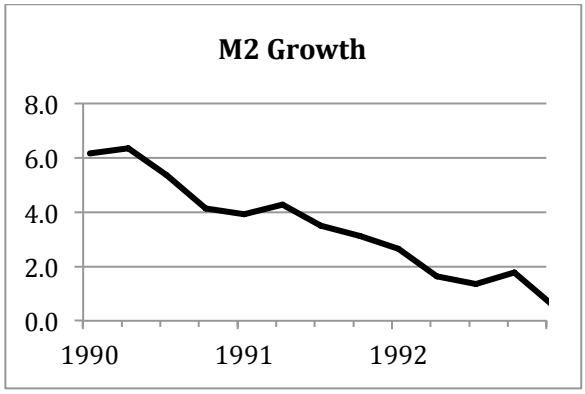
[173] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), p. 15-16
[174] Alan Greenspan, "Remarks," before the Economic Club of New York, N.Y. April 19, 1993
[175] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), p. 16
[176] Koo, *Holy Grail*, 2009

top of base money. If bank lending slows down, either due to banks rebuilding capital and working up reserves, or because the public is reluctant to borrow, the monetary transmission mechanism breaks down. Thus monetary easing is seriously hampered, because expanding the monetary base through open market operations has little effect on the broader monetary aggregates.

Looking back at the early 1990s, Greenspan complains that "[n]othing we did at the Fed seemed to work." The FOMC had started its easing cycle well before the recession broke out, "but the economy had stopped responding." In spite of lowering the fed funds rate twenty-three times between July 1989 and July 1992, "the recovery was one of the most sluggish on record." He described the forces impeding growth as a "fifty-mile-an-hour headwind."[177] At the time, he noted that "the cumulative upward momentum that characterized previous recoveries was absent." Moreover, the "growing propensity of households to pare debt and businesses to reduce leverage was a signal that the balance sheet restraints, feared by many for a long time, had indeed taken hold, working against the normal forces of economic growth."[178] A contemporary observer noted that the "year 1991 marked the first time in a generation that American companies and consumers decided to get out of debt."[179]

Applying the balance sheet recession approach to this episode, it would seem that, once more, events originating in the financial sector, rather than monetary policy, were the main determinants of disinflation. When the public enters into debt minimization mode, money growth will halt, putting downward pressures on spending and prices. M2 growth decelerated significantly in spite of substantial rate cuts. (See figure 4.7.)

Figure 4.7 M2 Growth, 1990-1992

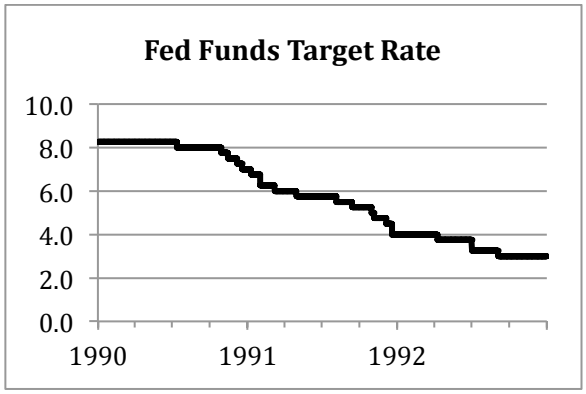


Source: St. Louis Fed, FRED (M2NS, % change from a year ago)

[177] Greenspan, *Age of Turbulence*, 2007, p. 118
[178] Alan Greenspan, "Testimony," before the Committee on Ways and Means U.S. House of Representatives, December 18, 1991
[179] Christopher Wood, *The Bubble Economy*, Solstice, 2006, p. 180 [Originally published in 1993]

The monetary base expanded by around 5.5 percent on an annual basis in 1990, 7.4 percent in 1991 and then 10.2 percent in 1992, but to little avail. The broader monetary aggregates were not responding as intended.[180] The fed funds target rate was reduced in a series of steps during 1990-1992, as seen in figure 4.8. Still, the "headwind" kept the recovery on hold.

Figure 4.8 Monetary Policy Rate, 1990-1992



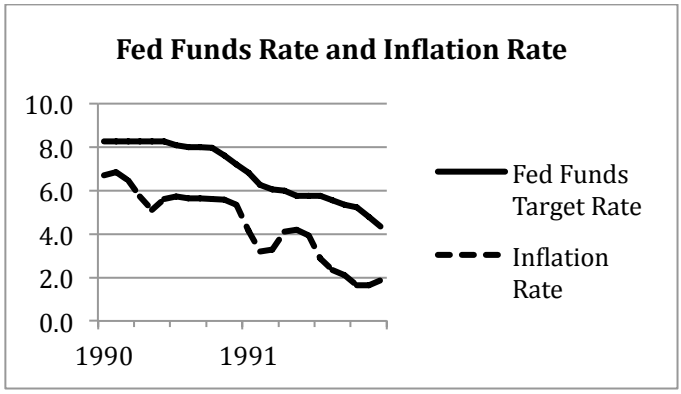
Source: St. Louis Fed, FRED (DFEDTAR)

The Fed was criticized for not cutting rates fast enough. In the words of Greenspan: "Some have argued that monetary policy has been too cautious, that rates should have been lowered more sharply or in larger increments." However, he was concerned with the "sensitivity of inflation expectations" and what was seen as a necessary period of readjustment, working through structural imbalances in order to "establish a basis for sustained growth." Too aggressive easing was deemed inappropriate, since it would not have "dealt fundamentally with the very real imbalances" that "needed to be resolved before sustainable growth could resume."[181] This line of reasoning deserves some attention, since it is almost the exact opposite of how the Fed was perceived to behave in the 2000s, when the notion of a "Greenspan put" came to the fore.

A major motive behind the hesitant rate cuts during the recession of 1990-91 seems to have been the fear of reemerging inflation. Reading through sources of the early Greenspan years, this fear always seems to loom high among Fed policymakers. Some critics, including several media commentators and political leaders, questioned the rationale behind this gradualist approach to monetary easing when inflation was in fact falling.[182] (See figure 4.9).

[180] St. Louis Fed, FRED, monetary base (BOGUMBNS), percentage change from a year ago on the first day of each year, showing the growth rate of the preceding year
[181] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1)
[182] Among the critics were Treasury Secretary Nick Brady, who in 1991 sent Greenspan a letter stating that every single economist he had spoken to said it would do no harm to cut short-term interest rates further. As reported by the chairman, Brady complained about "lack of forceful leadership at the Fed." Greenspan, *Age of Turbulence*, 2007, p. 121

Figure 4.9 Monetary Policy Rate and Inflation Rate, 1990-1991



Source: St. Louis Fed, FRED (DFEDTAR, CPIAUCNS)

Greenspan answered that this argument was a "non sequitur," since the "disinflation very likely would not have occurred in the context of an appreciably more stimulative policy, and such a policy could have led to higher inflation in the next few years." Moreover, the "credibility of noninflationary policies would have been strained and longer-term interest rates likely would be higher, inhibiting the restructuring of balance sheets and reducing the odds of sustainable growth."[183]

Arguments advanced at the time, as well as retrospective commentaries, suggest that the FOMC did not associate the disinflation with the balance sheet recession, creating downward pressures on money and spending. Instead, the behavior of inflation was primarily attributed to expectations. Greenspan thought that the lack of a clear commitment to the overriding goal of price stability could have led long-term interest rates to shoot up, making the readjustments and repair of damaged balance sheets for households and corporations harder, prolonging the crisis. However, if the public were not taking on new debt, this would hardly be the case, as the demand for funds would be depressed, keeping bond rates in check. Symptomatically, yields on government securities came down during the early 1980s.[184]

These opposing perspectives point to some major issues of contention within macroeconomic thought, touched upon in the introduction. The balance sheet recession approach emphasizes underlying dynamics of debt and asset prices, as suggested by the financial instability framework. Moreover, implications for the behavior of the monetary aggregates and aggregate spending are stressed by the monetary equilibrium approach. Falling velocity and a

[183] Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), p. 18
[184] Yields on Treasuries with 30 and 10-year maturities came down from 8 percent in early 1991 to 6 and 5.5 percent in mid-1993, before trending upwards to 8 percent in late 1994. Treasuries with 3-month maturity came down from 6 percent in early 1991 to 3 percent in ate 1992. The secondary market rates for 1 year Treasuries show a similar movement. St. Louis Fed, FRED (GS30, GS10, GS3M, DTB1YR)

decelerating money supply will put contractionary pressures on the economy. In contrast, the main paradigm emerging during the Great Moderation stresses the role of expectations in the dynamic interplay between the public and macroeconomic policymakers, related to inflation, output and employment. The expectations perspective is, as discussed in the previous chapter, based on the historical lessons drawn from the 1970s and the academic response to the Great Inflation, a time when financial markets and asset prices played less of a role in the observed macroeconomic disturbances.

Greenspan made explicit references to how expectations had been unanchored by these inflationary experiences. He argued that in the 1950s and 60s, the interactions between inflation and inflation expectations was less important because "[s]avers and investors, firms and households made economic and financial decisions based on an implicit assumption that inflation, over the long run, would remain low enough to be inconsequential." As a result, inflation premiums on long-term interest rates were low. Hence, "monetary policy had far more room to maneuver," and the Fed could engage in aggressive monetary easing "without igniting inflation expectations."[185]

Even during the inflationary 1970s, "there was a clear reluctance to believe that the inflation being experienced was other than transitory," as witnessed by the behavior of bond yields. However, "the dam eventually broke, and the huge losses suffered by bondholders during the 1970's and early 1980's sensitized them to the slightest sign, real or imagined, of rising inflation. At the first indication of an inflationary policy, monetary or fiscal, investors dumped bonds, driving up long-term interest rates." In conclusion, these sensitivity issues made monetary policymaking a much harder task for the Fed: "An overly expansionary monetary policy, or even its anticipation, is embedded fairly soon in higher inflation expectations and nominal bond yields."[186] Thus, even in face of the "headwinds" of the early 1990s, the FOMC saw the need to move carefully, so as not to ignite new inflationary expectations, in turn, pushing up consumer prices.

Policymakers envisioned that their main task was to manage these expectations. Such concerns would weigh heavy in 1994, when the economy showed signs of fully recovering from the S&L crisis and bond yields were moving upwards.

[185] Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), pp. 16-17
[186] Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1), pp. 17

Preemptive Tightening

On February 4, 1994, the FOMC decided on the first interest rate hike in close to five years. The credit crunch of the early 1990s had finally ended, and it seemed to be the right time to end the low interest rate policies of this period. Moreover, the FOMC wanted to take control of the business cycle. As explained by Greenspan, looking back at this policy decision:

> "We wanted the inevitable downturn, when it came, to be less of a roller-coaster ride—a moderate slowing instead of a sickening plunge into recession. The Fed had long tried to get ahead of the curve by tightening rates at the first sign of inflation, before the economy had a chance to seriously overheat. But raising rates in this way had never averted a recession."[187]

He adds that the FOMC "opted to take advantage of the relative economic tranquility to try a more radical approach: *moving gently and preemptively, before inflation even appeared*." (Emphasis added.) Thus was formulated a strategy of preemption, stressing the need to counter an upside risk before it materialized. Greenspan explained the new monetary approach to Congress at a February, 1994 hearing:

> "[I]f the Federal Reserve waits until actual inflation worsens before taking countermeasures, it would have *waited too long*. Modest corrective steps would no longer be enough to contain the emerging economic imbalances […] Instead more wrenching measures would be needed, with unavoidable adverse side effects on near-term economic activity."[188]

In other words, preemption was called for, because reacting later to contain a threat once it had surfaced would entail "more wrenching measures" and potentially more adverse economic outcomes. As part of this strategy, the Fed was in need of a new tool to more closely steer inflation expectations. It had to communicate its intentions directly to the public in order to influence bond rates.

As explained by Blinder and Reis, "if the Fed is reasonably transparent, the bond market will do much of its work for it."[189] The rationale behind this thinking is that long-term interest rate matter more than short-term rates to economic activity. But the Fed only directly controls one short-term rate, the overnight fed funds rate. According to the theory of the "term structure of interest rates," long-term rates reflect expected future short-term rates (plus a premium). Thus "expectations about future central bank behavior provide the essential link between short rates and long rates."[190]

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[187] Greenspan, *Age of Turbulence*, 2007, p. 154
[188] Quoted in Greenspan, *Age of Turbulence*, 2007, p. 154
[189] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 39
[190] Blinder, *Central Banking*, 1999, pp. 70-71

By clearly communicating its intentions during a tightening or easing cycle, the Fed can more closely influence long-term rates and make monetary policy more efficient. Transparency thus becomes key in managing inflation expectations. This realization came somewhat reluctantly to the FOMC and the Fed Chairman. For instance, in October 1989, Greenspan stated before a House committee that announcements of FOMC decisions "could impede timely and appropriate adjustments to policy."[191] In a confidential FOMC telephone conference, in October 1993, he reiterated his strong-held views on the disclosure issue, saying that "immediate release of the directive could threaten to roil markets unnecessarily, and concern about market reaction could reduce flexibility in decisionmaking."[192]

Only a few months later the FOMC was discussing a move towards transparency by disclosing its policy intentions to the public. At the February 4, 1994 committee meeting, Greenspan expressed that he wanted to raise a question that had been "tugging" at him for the last number of weeks—whether the FOMC should announce its interest rate decision. He added, "when we move in this particular context, which of course will be the first time we have moved since September 1992, we are going to have to make our action very visible." He was "particularly concerned that if we choose to move tomorrow, we make certain that there is no ambiguity about our move."[193]

Robert Parry, President of the Federal Reserve Bank of San Francisco, supported Greenspan's proposed policy statement, but pushed the agenda further by calling for a discussion "about the desirability of similar statements in the future" as some FOMC members believed that "there is some advantage to doing it on a continued basis."[194] Robert P. Forrestal, president of the Federal Reserve Bank of Atlanta, voiced a contrary concern that this move would create precedent—that the Fed would be "pushed by pressures" to "make this an ongoing operating procedure." Thinking such a procedure would result in the loss of "some flexibility," he wanted the statement to be a one-time event.[195] The FOMC decided to go ahead with the statement, which was released immediately following the meeting. The full statement read:

> "Chairman Alan Greenspan announced today that the Federal Open Market Committee decided to increase slightly the degree of pressure on reserve positions. The action is expected to be associated with a small increase in short-term money market interest rates.
>
> The decision was taken to move toward a less accommodative stance in monetary policy in

[191] Greenspan, "Testimony," before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, U.S. House of Representatives, October 25, 1989; quoted in Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 39
[192] Greenspan quoted in Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 40
[193] *Transcript*, February 4, 1994, p. 29
[194] *Transcript*, February 4, 1994, p. 31
[195] *Transcript*, February 4, 1994, p. 31

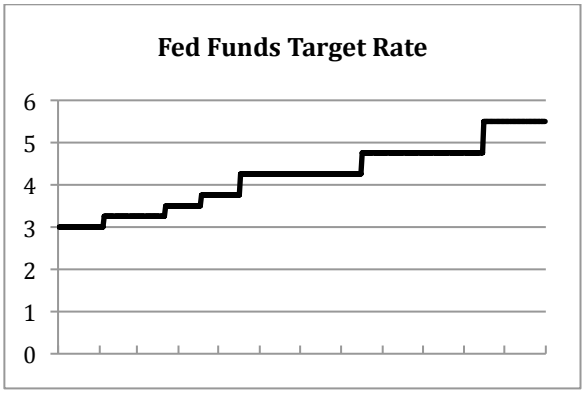
order to sustain and enhance the economic expansion.

Chairman Greenspan decided to announce this action immediately so as to avoid any misunderstanding of the Committee's purposes, given the fact that this is the first firming of reserve market conditions by the Committee since early 1989."[196]

As Forrestal had worried, this action would prove to be a lasting precedent. To Parry's credit, it was a precedent that FOMC members and other Fed officials would come to embrace as an important tool in managing the public's inflation expectations.

The rate hike of February 1994 was followed by tightening measures throughout the year, bringing the fed funds target rate up from 3 percent to 5,5 percent, as shown in figure 4.10.

Figure 4.10 Monetary Policy Rate, 1994



Source: St. Louis Fed, FRED (DFEDTAR)

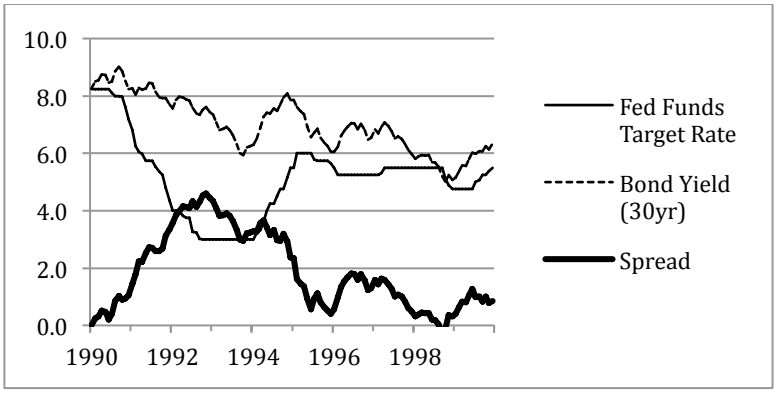
Once more, the Fed was criticized for conducting too tight policy.[197] Greenspan explained the reasoning behind these decisions before a House committee: "To be successful, we must implement the necessary monetary policy adjustments well in advance of the potential emergence of inflationary pressures, so as to forestall their actual occurrence." It was not sufficient to look at current inflation figures, since "[s]hifts in the stance of monetary policy influence the economy and inflation with a considerable lag, as long as a year or more." Thus the "challenge of monetary policy is to interpret current data on the economy and financial markets with an eye to anticipating future inflationary or contractionary forces and to countering them by *taking action in advance*." (Emphasis added.)[198]

[196] *Statement*, February 4, 1994
[197] In Greenspan's words: "Some critics of our latest policy actions have noted that we tightened policy even though inflation had not picked up. That observation is accurate, but is not relevant to policy decisions." Alan Greenspan "Testimony," before the Committee on the Budget U.S. House of Representatives, June 22, 1994, p. 4
[198] Alan Greenspan "Testimony," before the Committee on the Budget U.S. House of Representatives, June 22, 1994, p. 4

Greenspan noted that there "remains a significant inflation premium embodied in long-term interest rates, reflecting a still skeptical world financial market view that American fiscal and monetary policies retain some inflation bias," a price still paid for the inflationary 1970s, "despite major successes in reversing inflationary pressures during the past 15 years." Hence the need to keep strengthening the credentials of the central bank of containing inflationary pressures; "judging from the remaining inflation premium embodied in long-term rates, the job is not yet complete." He added: "Having paid *so* large a price in reversing inflation processes to date, it is crucial that we do not allow them to re-emerge."[199]

The trajectory of the yield on government securities with 30-year maturity is displayed in figure 4.11. So are the federal funds rate and the spread between the two. As can be seen, bond yields were on the rise slightly before the FOMC decided to start raising rates in February 1994, giving rise to concerns of inflationary expectations trending upwards. The yield on 30-year Treasuries continued to climb throughout most of 1994, before declining the following year. The FOMC initiated rate cuts after the turnaround in long-term interest rates.

Figure 4.11 Long and Short-term Interest Rates, 1990-1999



Source: St. Louis Fed, FRED; Author's calculations (DFEDTAR, GS30)

The ample attention given to bond markets would become a characteristic trait of how monetary policy was conducted in the Greenspan years and reflected the importance given to managing expectations and the desire to act preemptively, containing inflationary pressures before they surfaced in price statistics.

[199] Alan Greenspan "Testimony," before the Committee on the Budget U.S. House of Representatives, June 22, 1994, p. 5

The Early Greenspan Standard

The "standard" that emerged during the first decade of the Greenspan FOMC pointed to specific operating procedures informed by an evolving model of the economy. The choice of policy instrument was clear—the manipulation of short-term interest rates in the market for reserve balances (the fed funds market) through the use of open market operations. The overarching goal was price stability. But what exactly does "price stability" mean? How is it defined? How is it measured? Which measures should be used to attain this goal, and how does the central bank know when the goal is achieved?

In 1996, the Fed dedicated a Jackson Hole symposium to the topic of "Achieving Price Stability," discussing questions like these. In his opening remarks, the chairman stressed the "operational difficulty of knowing exactly to what we are all referring when we speak of 'price stability.'" He defined this desirable outcome as a situation "when economic agents no longer take account of the prospective change in the general price level in their economic decisionmaking." The goal was to remove "unproductive price-expectation-driven actions from economic activity"—a "necessary condition for economic stability and maximum efficiencies."[200] The operational definition put great weight on managing expectations. But expectations cannot be observed directly. Thus to measure whether the central bank has achieved its goal of price stability, it must make use of "proxies." One such proxy is obviously some kind of index measuring the overall price level. However, there will always be an element of arbitrariness to such indexes and they can only tell policymakers of price movements retrospectively.

Greenspan noted that "we aren't going to get much assistance in this endeavor from conventional textbook models or run-of-the-mill academic discussions," implying that success rested upon some interpretative capacity on the part of the monetary policymakers. Knowing that "a general price level must exist in principle" the question becomes how to observe the implications of such a level in real world economic life. One answer would be to look at market transactions reflecting anticipated changes in the price level over time:

> "For so long as contracts are being made that involve the exchange of future claims on goods and services denominated in nominal units, the parties to those contracts will have made some implicit or explicit *judgment about the forward purchasing power* of those nominal units. And those judgments will be embodied in the prices placed on the transaction." (Emphasis added.)[201]

[200] Alan Greenspan, "Opening Remarks," *Kansas City Fed Symposium*, 1996, pp. 1-2, 5
[201] Greenspan, "Opening Remarks," *Kansas City Fed Symposium*, 1996, p. 4

A proxy by which price stability and inflation expectations can be observed are the terms of contracts involving "the exchange of future claims on goods and services." One such type of claim is bonds, and one type of bond, government securities (Treasuries), is exchanged in a market that is both deep and highly liquid and with a negligible default risk. The main risk pertains to swings in inflation. The yield on these securities could thus reveal the expected rate of inflation during the lifetime of the security. In the words of Greenspan, "expectations of future changes in the purchasing power of the currency become embedded in the term structure of interest rates." Extracting inflation expectations is still "no easy task, in part because it requires assumptions about real interest rates as well as term and inflation risk premiums," but it gives the authorities a window into the public's expectations by gazing at actual market behavior.[202]

So what are the implications for the Fed practices? For one, ample weight is given to observe the movements of bond yields. "Looking out the window" to see what is going on with the inflation rate, as measured by different indexes, is not enough. To firmly anchor inflation expectations, monetary policymakers must look into the future or, more precisely, the market for future claims. Price stability will only be achieved when expected inflation, as embedded in the term structure of interest rates, are firmly anchored at the desired level. Moreover, long-term interest rates reflect market participants' expectations of future short-term interest rates and can thus be gauged as a measure of whether the FOMC is able to successfully convey to the public the desired direction of its interest rate decisions when in a tightening or easing cycle. To aid in this process, policymakers can make use of additional tools to indirectly manage long-term interest rates, notably policy statements, revealing the "bias" of the policymakers towards tightening or easing.

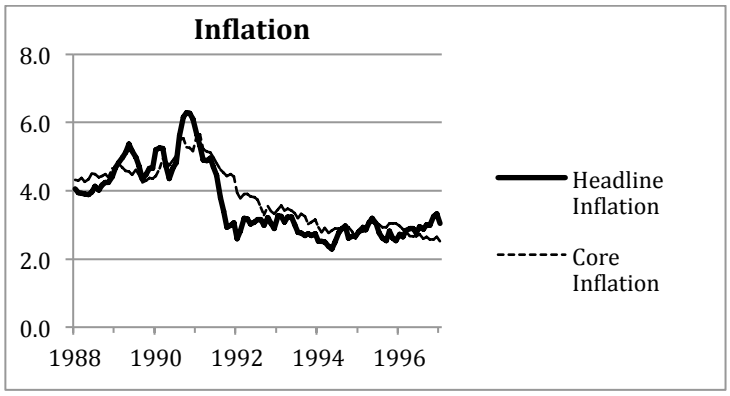
Thus one important intermediate goal that emerged was to manage inflation expectations rather than inflation directly. This was done by carefully tracking developments in bond markets, especially the markets for government debt.[203] The interpretations involved of developments taking place in asset markets—not for the sake of monitoring financial imbalances, but rather to assess inflationary expectations—point to the importance of

[202] Greenspan, "Opening Remarks," *Kansas City Fed Symposium*, 1996, p. 4

[203] In 1989 Kohn pointed to "the recent emphasis on a variety of financial market variables, such as yield curves and exchange rates, that incorporate market expectations about future levels of real interest rates and inflation. In particular, these variables are likely to send clear signals if policy is perceived to be deflationary or inflationary because it is seen as keeping real interest rates substantially above or below equilibrium levels." Moreover, he points to "the heightened sensitivity of expectations-driven variables, including yield curves, exchange rates, and commodity prices. At a minimum, these variables help the policymaker judge when market participants consider that conditions are ripe for significant movements in inflation rates. Thus, from these indicators policymakers may be able to infer the credibility that the markets accord their anti-inflation objectives." Kohn, *Kansas City Fed Symposium*, 1989, pp. 136, 141

judgment on the part of the monetary policymakers and, in consequence, the use of discretion in policymaking. This contrasted with the academic emphasis on rule-bound authority, exemplified by Kydland and Prescott (1977), as well as the tendency towards formalized inflation targeting in other industrial countries throughout the 1990s.[204] At the 1996 Jackson Hole symposium, FOMC secretary Kohn discussed the tradeoff between the long-term discipline of a formal inflation target and the short-term advantages of operating more flexibly. He stressed that the "less quantitative and time-specific objective of the Federal Reserve" had given it "considerable flexibility in responding to unexpected developments, enabling it to smooth the path of output and vary the pace of progress toward price stability as circumstances seemed to dictate." He concluded: "The results largely speak for themselves. Inflation has been brought down to a low level, with only one mild recession since 1982."[205]

Figure 4.12 Consumer Prices, 1988-1996



Source: St. Louis Fed, FRED (CPIAUNS, CPILFENS; % change from a year ago)

The overall Fed track record of inflation from 1988 to 1996 is shown in figure 4.12. These developments took place without any formal commitment by the central bank to target inflation. Kohn criticized the use of strict inflation targeting for giving considerable weight on "an inherently uncertain and imprecise projection." Knowing that "forecasts will be wrong and contingencies will arise in ways that are unanticipated," flexibility was called for, allowing policy to move "in directions that may seem counterintuitive to the general public under inflation targets."[206] Such contingencies would play a larger role during the second half of the Greenspan era, from 1997 to 2006, when a wide range of threats would pose new challenges to FOMC decisions. These threats are the topics of the subsequent chapters.

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[204] Finn E. Kydland and Edward C. Prescott, "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy*, vol. 85, no. 3, 1977, pp. 473-492; Ben S. Bernanke (2003), "A Perspective on Inflation Targeting," remarks at the Annual Washington Policy Conference of the National Association of Business Economists, Washington, D.C., March 25, 2003

[205] Donald L. Kohn, "Commentary: What Operating Procedures Should Be Adopted to Maintain Price Stability?—Practical Issues," *Kansas City Fed Symposium*, 1996, p. 298

[206] Donald L. Kohn, "Policy Targets and Operating Procedures in the 1990s," *Kansas City Fed Symposium*, 1989, p. 137

5. FEAR OF FINANCIAL FALLOUTS: THE GREAT GLOBAL BOOM

> "Someday, of course, the expansion will end; human nature has exhibited a tendency to excess through the generations with the inevitable economic hangover. […] It is the job of economic policymakers to mitigate the fallout when it occurs, and, hopefully, ease the transition to the next expansion"[207]
>
> —Alan Greenspan (1999)

In February 1998, Greenspan reaffirmed the FOMC commitment to preemptive tightening: "History teaches us that monetary policy has been its most effective when it has been preemptive." The time lag between policy actions and inflation "implies that if policy actions are delayed until prices begin to pick up, they will be too late to fend off at least some persistent price acceleration and attendant economic instabilities." In the preceding year, the pressure on resources steered the FOMC "toward being more inclined to tighten than to ease monetary policy." Thus in March 1997, the committee decided upon "modest incremental restraint," raising the federal funds target rate by 0.25 percentage points, to 5.5 percent.[208]

That year, real GDP grew by close to four percent, the fastest annual growth rate in 10 years. The unemployment rate dropped to 4.75 percent, the "lowest sustained level since the late 1960's," as pointed out by Greenspan. These developments supported "the view that such low inflation, as closely approaching price stability as we have known in the United States in three decades, engenders many benefits." The chairman noted that productivity growth had been on the rise, in part spurred by low inflation. The rise in productivity was moreover associated with reductions in the annual federal budget deficits, leaving more room for private sector investment, as well as "the rapidly increasing efficiency" of U.S. financial markets, attributed to "new technologies and of significant market deregulation over the years."[209]

Deregulation of financial markets and capital accounts, freeing up international capital flows, had spurred a new global financial landscape. These developments were deemed to be highly beneficial. In the words of Greenspan, an "increasingly sophisticated international financial system" had "fostered impressive growth in world trade and in standards of living for the vast majority of nations who have chosen to participate in it." However, there was a downside to these developments, as the system had "the capability to rapidly transmit the consequences of

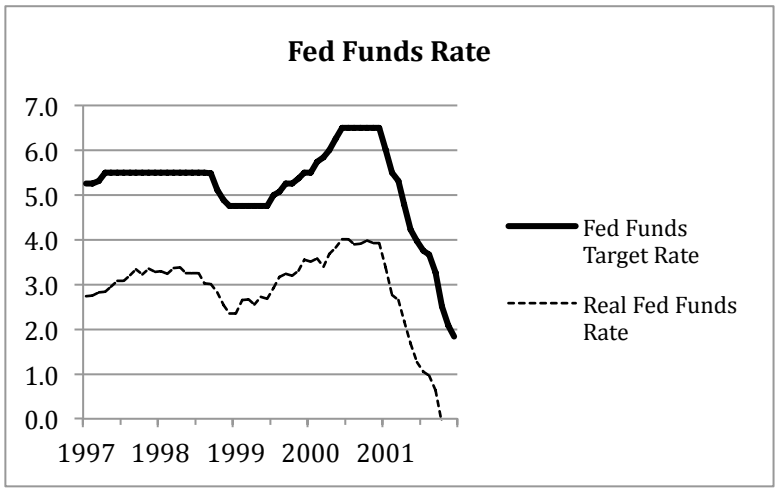
[207] Alan Greenspan, "Monetary policy and the economic outlook," testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999
[208] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1998 (1), p. 30
[209] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1998 (1), p. 28-29

errors of judgment in private investments and public policies to all corners of the world at historically unprecedented speed."[210]

Starting in the summer of 1997, a worldwide contagion in financial markets spread at historically unprecedented speed, changing priorities among monetary policymakers and gradually influencing their understanding of the economy. During most of the late 1990s, the FOMC was hesitant in raising interest rates when output and employment displayed strong growth. Moreover, in the fall of 1998 the fed funds rate was cut 0.75 percentage points in an attempt to forestall the potential fallout from the crisis in global financial markets. Once the crisis was perceived to have passed, priorities shifted back to forestalling a rise in inflation, as output and labor markets showed increasingly signs of overheating in 1999 and early 2000. Then the U.S. economy experienced a major financial incident of its own, this time in equity markets as the dotcom boom came to an end. The Fed only hesitatingly responded to these developments, but once the easing cycle was initiated in early 2001, the fed funds rate came down rapidly and dramatically, spurred on by the terror attacks in September of that year.

The trajectory of the federal funds rate, nominal and real, during the years of financial turbulence from the Asian crisis to 9/11, is displayed in figure 5.1.

Figure 5.1 Monetary Policy Rate, 1997-2001



Source: St. Louis Fed, FRED; Author's calculations (DFEDTAR, CPIAUCNS)

This chapter will take a closer look at these developments and the new understandings that emerged, in the end leading to new revisions of monetary doctrines and practices.

[210] Alan Greenspan, "International economic and financial systems," Testimony before the Committee on Banking and Financial Services, U.S. House of Representatives, September 16, 1998

A First Step Towards Downside Preemption

After the March 1997 rate hike, the FOMC decided against additional restraint, leaving the federal funds at 5.5 percent throughout the year, "despite further tightening of the labor market." One reason was that measured inflation fell, due to an appreciating dollar, weak commodity price growth and faster productivity growth. By keeping the nominal fed funds rate still in the face of falling inflation expectations, it was argued that the FOMC conducted "passive" tightening, through a modest rise in the real fed funds rate—the nominal rate adjusted for a "proxy for inflation expectations."[211]

Though the economy was showing signs of strong growth and "heated" labor markets going into 1998, the FOMC was worried about downside risks that could upset the otherwise bright outlook. Greenspan noted that the projections for aggregate spending on goods and services were less assured "because of storm clouds massing over the Western Pacific and heading our way." In the summer of 1997, a financial crisis erupted in several East Asian countries, gradually spreading to other emerging markets. These developments put strains on international financial markets, threatening to adversely impact the U.S. as well.

One concern was that exports would dampen, exerting a "discernible drag on total output in the United States." As for the inflation outlook, "Asian restraint" would most likely result in several developments putting downward pressures on price growth. An appreciating dollar was expected to lead to a further decline in the prices of imported goods. This would in turn make "domestic producers hesitant to raise their own prices" due to increased competition from cheaper foreign goods. Moreover, "lesser demands for raw materials on the part of Asian economies as their activity slows" would keep commodity prices in check.

The key question was "whether the restraint building from the turmoil in Asia will be sufficient enough to check inflationary tendencies that might otherwise result from the strength of domestic spending and tightening labor markets." In other words, which factors would win out, high levels of activity in the domestic economy, usually associated with inflationary forces, or foreign developments, exerting disinflationary forces on the U.S.? The FOMC came to the conclusion that, "any intensification of inflation should be delayed, very gradual, and readily reversible," leading the committee to decide that "monetary policy should most appropriately be kept on hold." [212]

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[211] Greenspan, "Statement," *Humphrey-Hawkins*, 1998 (1), p. 30
[212] Greenspan, "Statement," *Humphrey-Hawkins*, 1998 (1), p. 30

As before, the Greenspan FOMC displayed a willingness to continuously revise the economic model to reflect perceived changes to the economic landscape:

> "The way America does business, including the interaction among the various economic players in our economy, is in the midst of a significant transformation, though the pace of change is unclear. […] As a consequence, many of the empirical regularities depicting the complex of economic relationships on which policymakers rely have been markedly altered. The Federal Reserve has thus been pressed to continuously update our understanding of how the newer forces are developing in order for us to address appropriately our underlying monetary policy objective: maximum sustainable economic growth."[213]

Such transformational changes called for assessment of "the newer forces" by carefully examining a wide range of economic indicators, including broad sets of financial data, before drawing any policy conclusions: "With the continuation of a remarkable 7-year expansion at stake and so little precedent to go by, the range of our intelligence-gathering in the weeks ahead must be wide and especially inclusive of international developments."[214]

In the spring and early summer of 1998, FOMC concerns shifted back to an upside risk of a "rise in inflation" seen as "the primary threat to the continued expansion of the economy." However, when meeting in August, "the risks had become balanced."[215] This was soon revised yet again, as downside risks seemed to threaten the economy. At the FOMC meeting in late September, the fed funds target rate was cut by 0.25 percentage points to 5.25 percent in order to "cushion the effects on prospective economic growth in the United States of increasing weakness in foreign economies and of less accommodative financial conditions domestically."[216] At the meeting, Richard Fisher, executive vice president of the New York Fed in charge of open market operations, pointed to financial indicators suggesting market expectations "not of a single easing of monetary policy but of a whole series of easings" into 1999. These expectations began building in August, in response to the Russian default crisis, among policymakers referred to as the "Russian devaluation and moratorium."[217] This crisis was putting strains on bond markets around the world, witnessed by a "rush out of emerging market and higher yielding instruments in late August," leading to a sell-off of more risky,

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[213] Alan Greenspan, "Monetary policy and the economic outlook," Testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999
[214] Greenspan, "Statement," *Humphrey-Hawkins*, 1998 (1), p. 31
[215] Alan Greenspan, "Question: Is There a New Economy?," remarks at the Haas Annual Business Faculty Research Dialogue, University of California, Berkeley, California, September 4, 1998
[216] *Statement*, September 29, 1998
[217] *Transcript*, September 29, 1998, p. 17

private market bonds and increased demand for U.S. Treasuries.[218] This signaled greater difficulties for private companies in obtaining funds in bond markets.

Greenspan pointed to the "major trauma in world financial markets" which occurred "when the Russian devaluation and debt moratorium were announced."[219] This posed a puzzle; the size of the Russian economy was negligible in the global economy, so how could a Russian debt default trigger such widespread effects in world financial markets? One answer was that the episode indicated that the contagion from the Asian crisis was still in motion. Another explanation related to moral hazard. It would seem that international investors had become accustomed to the idea that emerging markets would be bailed out by the IMF, sometimes aided by the U.S., as happened in Asia. When the attempted rescue of Russia was aborted, FOMC members observed "an abrupt reassessment of risks," and a flight to safety.

The September 1998 decision to cut the fed funds target rate did "not rest on incoming data about the economy." In fact, the economy was still growing strong, the unemployment rate remained low and inflation was edging higher, especially measures of core inflation. Rather, the case for a rate cut relied on the potential threats stemming from "the sea change in investors' perceptions of risk," causing financial conditions to become more restrictive. However, moving cautiously was called for as the unemployment rate was "well below most estimates of its sustainable level," which had raised concerns among committee members for some time that "economic growth needed to slow substantially from the pace of the last few years—most likely to below trend—just to keep inflation from accelerating."[220]

As can be discerned from these policy deliberations, the natural rate framework still applied to the overall assessment of the economy. However, new downside risks had materialized, stemming from developments within financial markets. Even though these factors had not yet made any visible impact on the main economic indicators—output, employment and inflation—they were looked as potentially disturbing, leading the FOMC to cut rates cautiously. The target rate was further lowered by 0.25 percentage points on October 15, due to "[g]rowing caution by lenders and unsettled conditions in financial markets" which were "likely to be restraining aggregate demand in the future."[221] A final cut, which would turn out to be the last reduction in the fed funds rate of that century, was decided upon at the

[218] *Transcript*, September 29, 1998, p. 18
[219] *Transcript*, September 29, 1998, p. 21
[220] As pointed out by FOMC secretary Kohn; *Transcript*, September 29, 1998, p. 77-78
[221] *Statement*, October 15, 1998

November 17 committee meeting. By this time, conditions in financial markets had "settled down materially" though "unusual strains" remained.[222]

Thus the FOMC lowered the target for the fed funds rate 0.75 percentage points in the fall of 2008, responding to potential threats from the fallout of the emerging markets crises raising downside risks of "restraining aggregate demand in the future." The most visible sign of these financial strains within the U.S. was the near-collapse of the hedge fund Long-Term Capital Management (LTCM), of which the "abrupt and disorderly close-out" was judged to pose "unacceptable risks to the American economy." Thus, in September, New York Fed President William J. McDonough orchestrated an orderly bailout by private financial firms, in order to stave off a potential financial panic.[223]

At the start of 1999, The Fed could once more look back at a year of robust growth. Real GDP rose about 4 percent for the third year in a row, while the unemployment rate dropped even further, to 4.5 percent, the lowest level since 1970. Despite continued tight labor markets, headline inflation fell to its lowest level "in many decades," in part owing to falling prices on commodities and other imports, as well as strong productivity gains.[224]

Assessing this progress, Greenspan asked: "Can this favorable performance be sustained?" He was concerned that after eight years of expansion, the economy appeared to be "stretched in a number of dimensions, implying considerable upside and downside risks to the economic outlook." On the upside, high levels of economic activity, witnessed by strong growth and low unemployment, seemed unabated. At the same time, a rapid rise in equity prices raised "questions about whether shares are overvalued." Furthermore, debt levels were on the rise, both among households and firms, as well as the country's external debt, reflected in the growing current account deficit. On the downside, Greenspan held that the U.S. economy remained "vulnerable to the rapidly changing conditions overseas," which the events in the summer of 1998 showed could be "transmitted to U.S. markets quickly and traumatically." He concluded that "[i]n light of all these risks, monetary policy must be ready to move quickly in either direction" should Fed policymakers "perceive imbalances and distortions developing that could undermine the economic expansion."[225]

Thus he concluded with a *symmetrical* statement—that the Fed should stand ready to tighten or ease in the face of perceived upside or downside risks. During the summer of 1998, the

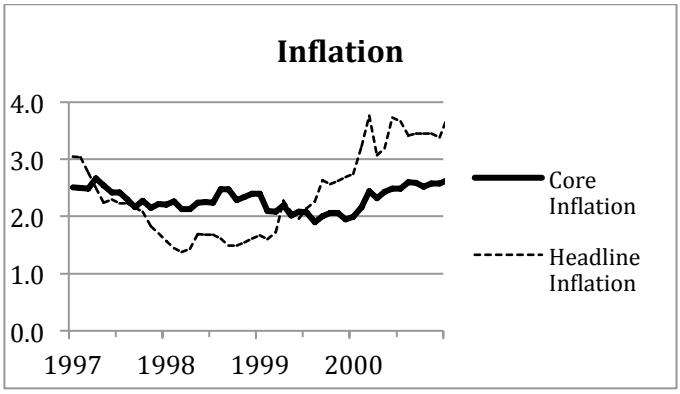
[222] *Statement*, November 17, 1998
[223] William J. McDonough, "Private-sector refinancing of the large hedge fund, Long-Term Capital Management," Testimony before the Committee on Banking and Financial Services, U.S. House of Representatives, October 1, 1998
[224] Greenspan, "Statement," Humphrey-Hawkins, 1999 (1), pp. 43-44
[225] Greenspan, "Statement," Humphrey-Hawkins, 1999 (1), pp. 44

balance had tipped towards easing, when the Russian default threatened to impact the U.S. economy. As the economic expansion continued well into 1999, however, the balance tipped the other way. In May, the FOMC released a statement that it was "concerned about the potential for a buildup of inflationary imbalances that could undermine the favorable performance of the economy." Hence it formulated a balance of risks sentence pointing toward "the possibility of a firming in the stance of monetary policy." Inflation still remained "quite subdued." But domestic financial markets had recovered and "foreign economic prospects" had improved "since the easing of monetary policy last fall."[226] Six weeks later, the FOMC initiated its tightening cycle, eventually bringing the federal funds rate up by 1.75 percentage points in less than a year.

A recurring message in the statements accompanying the rate hikes was that the FOMC was concerned about demand outgrowing potential supply, witnessed by strong growth and tight labor markets. As stated at the turn of the century, the committee remained "concerned with the possibility that over time increases in demand will continue to exceed the growth in potential supply, even after taking account of the remarkable rise in productivity growth. Such trends could foster inflationary imbalances that would undermine the economy's exemplary performance."[227]

Core inflation, measured as percentage changes in consumer prices less energy and food, was relatively stable throughout the late 1990s, hovering around 2 percent, before rising slightly in 2000, to around 2.5 percent. (See figure 5.2.)

Figure 5.2 Headline and Core Inflation, 1997-2000



Source: St. Louis Fed, FRED (CPIAUCNS, CPILFENS; % change from a year ago)

[226] *Statement*, May 18, 1999
[227] *Statement*, December 21, 1999

Headline inflation, that is, an index reflecting all consumer prices, fluctuated more strongly, in large part due to fluctuations in international oil prices, which fell slightly in 1997-98, and then rose substantially in 1999-2001(though these price movements seem almost trivial to what was observed in the period 2004-2010). The FOMC gives most attention to core inflation when making policy.[228] Inflationary pressures, indicate by core CPI figures, were not visible in 1999 and only slightly so in 2000. Thus, in the late 1990s, the FOMC maintained its preemptive stance towards inflation, combined with an increased sensitivity to downside risks emanating from financial markets, domestically and abroad.

Beginning in the summer of 1999, the policy rate was hiked 0.25 percentage points at a time, in successive steps. In May 2000, the FOMC decided on one last hike of 0.5 percentage points, bringing the target rate up to 6.5 percent. This policy decision was accompanied with a balance of risks sentence stating that the committee believed the risks were "weighted mainly toward conditions that may generate heightened inflation pressures in the foreseeable future."[229] This stance was largely held intact throughout the year, though in November the FOMC noted that private sector demand was showing signs of "softening." Moreover, "tightening conditions in financial markets" suggested that the economy could be in for a recession.[230] The turnaround in stock prices, and the economic developments in the first half of the 2000s will be dealt with in the subsequent chapter. For now, it will be useful to assess how developments in the late 1990s influenced Fed thinking.

Understanding the New Financial Landscape

As recalled from the previous chapter, the changing nature of the American economy, including the institutional makeup of U.S. financial markets, led to important changes in monetary policymakers' understandings. Monetary aggregates were dropped and the natural rate framework was amended in several ways. Ample weight was given to inflationary expectations, assessed by proxy indicators such as bond yields. With the emerging market crises that shook the world in the second half of the 1990s, new understandings were formed of how developments taking place abroad could impact the U.S. economy. Policymakers tried to gain a better understanding of the new international financial landscape in an era of deregulated capital flows and strong global growth. Greenspan had characterized the Mexican crisis at the middle of the decade as "the first crisis of this new international financial

[228] Blinder and Reis, *Kansas City Fed Symposium*, 2005, p. 44
[229] *Statement*, May 16, 2000
[230] *Statement*, November 15, 2000

system." The crisis that started in Asia in the summer of 1997, and then spread to other emerging markets, was "its second."[231]

Greenspan asserted that "it is just not credible that the United States can remain an oasis of prosperity unaffected by a world that is experiencing greatly increased stress."[232] Developments in the global economy would have both negative and positive consequences for the U.S. economy as assessed by monetary policymakers. On the one side, the threat of financial fallouts from abroad could impact domestic financial markets and impede American growth. On the other side, global economic developments seemed to keep U.S. inflation in check.

In the fall of 1998, monetary policymakers had been willing to take out an insurance against the potential fallout from the emerging markets crisis. As explained before the Congressional Joint Economic Committee in the summer of 1999, the "recovery of financial markets, viewed in isolation, would have suggested that at least part of the emergency injection of liquidity, and the associated 75 basis point decline in the funds rate, ceased to be necessary. But, with wage growth and price inflation declining by a number of measures earlier this year, and productivity evidently still accelerating—thereby keeping inflation in check—we chose to maintain the lower level of the funds rate." In other words, weak consumer price growth led the FOMC to believe that it could, at least for the time being, focus in on other problems, without being concerned with an uptick in inflation. Global disinflationary forces and strong domestic productivity growth combined to keep inflation in check.

While the noninflationary economic expansion in the U.S. appeared "remarkably stress free on the surface," there were still "developing imbalances" that would give reason to question whether these imbalances placed the economic expansion at risk. Among the imbalances were "an unsustainable trend" among households and firms "to increase their spending on goods and services beyond the gains in their income from production"—a trend that had been spurred by the rise in equity and home prices. Should the economy experience a dramatic contraction in equity markets prices, this would greatly reduce the extra spending.[233]

The return of normalcy to financial markets and "growing concerns about emerging imbalances" led the FOMC to contemplate rate hikes in 1999. One important issue that was discussed was the "weight to place on asset prices." Greenspan pointed out that the 1990s had

[231] Alan Greenspan, "The crisis in emerging market economies," Testimony before the Committee on the Budget, U.S. Senate, September 23, 1998
[232] Alan Greenspan, "Question: Is There a New Economy?," remarks at the Haas Annual Business Faculty Research Dialogue, University of California, Berkeley, California, September 4, 1998
[233] Alan Greenspan, "Monetary policy and the economic outlook," Testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999

"witnessed one of the great bull stock markets in American history." However, it would be "difficult to assess" whether there was in fact a bubble in advance of its bursting, since this required "a judgment that hundreds of thousands of informed investors have it all wrong. Betting against markets is usually precarious at best."[234]

The conclusion drawn was that monetary policy primarily should focus on price stability. It would be useful to "preempt forces of imbalance," but such forces were not always possible to identify, implying that financial imbalances were too hard to predict. Addressing imbalances in asset markets called for a different kind of preemptive stance, namely to "mitigate the fallout when it occurs, and, hopefully, ease the transition to the next expansion." This line of reasoning, and the observed willingness of the Fed to act preemptively in the face of potential financial fallouts, led to the notion of a "Greenspan put"—a floor for asset prices protecting investors against truly adverse outcomes when asset markets underwent large-scale downward corrections.[235] The commitment to "mitigate the fallout" from asset busts attracted criticism, leading to a debate on monetary policy and asset bubbles.

The Asset Bubble Controversy

During the last three decades, the world has seen a number of episodes of financial instability with serious macroeconomic costs in both industrial and emerging markets.[236] Questions regarding why such crises are taking place and what to do about them have increasingly moved to the top of policy agendas, both at the domestic level and in international forums, such as the G20. The most recent financial crisis, and the unresolved global imbalances associated with it, has made the need to find an answer to these problems more acute.

Among those researchers exploring this topic is a group of economists at the Bank for International Settlements (BIS) in Basel, Switzerland. They have developed a specific set of views on the nature of such booms and busts and how the authorities should react to them. The leading figure among these monetary policy analysts and advisors is William White, former chief BIS economist. He strongly believes that "price stability was not enough" to ensure stable and sustainable economic growth during the Great Moderation.[237] In contrast, to ensure long-run sustainability, the monetary authorities should address imbalances in order to prevent potential crises. BIS economists define these "imbalances" as "marked and sustained

[234] Greenspan, "Monetary policy and the economic outlook," 1999
[235] *Financial Times*, "'Grenspan put' may be encouraging complacency," December 8, 2000
[236] Claudio Borio and William White, "Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes," *BIS Working Papers*, no. 147, 2004
[237] William White, "Is Price Stability Enough?," *BIS Working Papers*, no. 205, 2006

deviations from historical norms." Among the main indicators of such imbalances are "very low household saving rates in many countries, with associated high internal and external debt levels" (debt held by domestic and foreign creditors), as well as "unusually high asset prices" (prices of housing, equity, bonds etc.).[238] In order to counter, curb and correct these imbalances, BIS economists have been leading proponents of the need for central banks to "lean against the wind," by raising interest rates and tightening money.

The Fed view on asset booms and busts emerged during the booming 1990s. Greenspan stressed psychological factors, as witnessed by the notion of "irrational exuberance."[239] Moreover, having "tried and failed" to address stock market imbalances, policymakers had come to the conclusion that attempts at leaning against asset prices through rate hikes would only ratchet up the long-term trend.[240] When raising rates in 1997 by a quarter of a percentage point, stock prices halted briefly, before rising again. Similarly, during the tightening cycle of 1994, stock prices leveled out, then started rising again once the tightening was over.[241]

At the 2002 Jackson Hole symposium, Greenspan explained the rationale behind moving preemptively to contain potential financial fallouts, but not address these kinds of imbalances as they were building up. The lessons drawn form the 1990s bull market was that it is "very difficult to definitively identify a bubble until after the fact—that is, when its bursting confirmed its existence." Even if monetary policymakers would be able to identify an unsustainable bubble, this would still not warrant preemptive tightening, since such a course

[238] William White, "Opening Remarks," in "Whither Monetary Policy: Monetary Policy Challenges in the Decade Ahead," *BIS Papers*, no. 45, March, 2009

[239] "Bubbles thus appear to primarily reflect *exuberance* on the part of investors in pricing financial assets." Furthermore, he identifies one source of such exuberance in productivity growth, as witnessed in the 1990s, which could lead to "an unwarranted, perhaps euphoric, extension" of these developments which "can drive equity prices to levels that are unsupportable […]" Alan Greenspan, "Opening Remarks," *Kansas City Fed Symposium*, 2002. The notion of irrational exuberance was first formulated in 1996: "[H]ow do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade?," Alan Greenspan, "The Challenge of Central Banking in a Democratic Society," remarks at the Annual Dinner and Francis Boyer Lecture of The American Enterprise Institute for Public Policy Research, Washington, D.C., December 5, 1996

[240] Greenspan, *The Age of Turmoil*, 2007, pp. 200-201

[241] In the words of Greenspan, "stock prices rose following the completion of the more than 300-basis-point rise in the federal funds rate in the twelve months ending in February 1989. And during the year beginning in February 1994, the Federal Reserve raised the federal funds target 300 basis points. Stock prices initially flattened, but as soon as that round of tightening was completed, they resumed their marked upward advance. From mid-1999 through May 2000, the federal funds rate was raised 150 basis points. However, equity price increases were largely undeterred during that period despite what now, in retrospect, was the exhausted tail of a bull market." Greenspan "Opening Remarks," *Kansas City Fed Symposium*, 2002, p. 5

of action could induce a contraction in economic activity—the "very outcome" policymakers "would be seeking to avoid."[242]

Greenspan formulated his policy ideal in quite strong terms: "But is there some policy that can at least limit the size of a bubble and, hence, its destructive fallout? From the evidence to date, the answer appears to be no." The chairman gained intellectual support from Ben Bernanke, who shortly after becoming Fed Governor in 2002 posed a timely question: "Can the Federal Reserve (or any other central bank) reliably identify 'bubbles' in the prices of some classes of assets, such as equities and real estate? And, if it can, what if anything should it do about them?" He agreed that being able to identify a bubble in progress is "intrinsically difficult" and that using rate hikes—tightening money through increases in the monetary policy rate—would lead to a slow-down of the economy, a cost considered too high to contemplate. However, he also diverged somewhat from Greenspan's views, giving some scope for Fed interventions into financial markets to correct asset bubbles. Firmly agreeing that monetary policy should not factor in asset price developments, he instead placed hopes in the Fed's use of its "regulatory, supervisory, and lender-of-last-resort powers to help ensure financial stability."[243]

Bernanke went on to express that this was "a *robust* strategy, in that—although it certainly does not eliminate all economic and financial instability—it protects the economy against truly disastrous outcomes, which history has shown are possible when monetary policy goes severely off track." He restated the commitments of the Greenspan put by stressing that "if a sudden correction in asset prices does occur," if necessary, "the Fed should provide ample liquidity until the immediate crisis has passed," citing Greenspan's response to the stock market crash of 1987 as a "good example" of how the Fed should conduct policy.[244]

Both Greenspan and Bernanke were of the strong belief that asset bubbles are hard to detect, and if Fed officials could somehow detect them, they should not make use of monetary policy instruments to curb the boom, but rather contain the fallout of the bust. Thus two contrary set of beliefs emerged during the 2000s—the Fed view and the BIS view—giving rise to a debate on whether the central bank should "lean" against asset prices in the boom phase, or "clean" up the mess afterwards.[245] The diverging views and the associated policy prescriptions are summarized in Table 5.1 below.

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[242] Alan Greenspan, "Opening Remarks," *Kansas City Fed Symposium*, 2002, pp. 4-5
[243] Ben S. Bernanke, "Asset-Price 'Bubbles' and Monetary Policy," remarks before the New York Chapter of the National Association for Business Economics, New York, New York, October 15, 2002
[244] Bernanke, "Asset-Price 'Bubbles' and Monetary Policy," 2002
[245] William R. White, "Should Monetary Policy 'Lean or Clean'?," Federal Reserve Bank of Dallas

Table 5.1 Fed vs. BIS Views on Monetary Policy and Asset Bubbles

Fed view	BIS view
Asset bubbles cannot be identified before they burst.	There are several indicators of imbalances, such as rapid credit growth, unsustainable levels of household and corporate debt as well as asset prices diverging strongly from historical trends.
The central bank should "clean up" the mess after a bubble bursts by easing money.	The central bank should "lean" against asset bubbles by tightening money.
Pre-emptive easing should be used to help distressed financial markets.	Pre-emptive tightening should be used to make sure financial imbalances don't get out of hand.
The costs of raising interest rates, in the form of lost output in the short run, are too high.	The costs of letting financial bubbles getting out of hand are too high in the long run.
Price stability is the main goal.	Price stability is not enough.

White, along with co-researcher Claudio Borio, presented the BIS views at the 2003 Jackson Hole symposium on "Monetary Policy and Uncertainty: Adapting to a Changing Economy." The reception among Fed officials was overall negative. For instance, Fed Governor Frederic Mishkin expressed the view that the "thrust of the Borio-White paper does not send us in the right direction." Rather than using monetary tightening to address the build-up of financial imbalances, he advocated the use of regulatory tools as the "first-best policy."[246]

This discussion goes to the very heart of major contentions within macroeconomics related to the conflicting views on money and cycles, briefly discussed in the introductory chapter. In the dominant view, prevailing among monetary practitioners and theorists, price stability is the norm, associated with a natural rate of output and employment. Adding in expectations, the main goal is to anchor anticipated inflation, so as to dampen fluctuations in economic activity. Within this paradigm, financial imbalances are seen as disturbing influences from outside—an exogenous force upsetting the otherwise balanced economy. In the alternative view, stressing monetary disequilibrium when interest rates cease to play their coordinating role in inter-temporal exchanges, imbalances can arise impacting the whole economic structure. Monetary disturbances can arise *even when prices are stable*. Symptomatically, BIS

Globalization and Monetary Policy Institute, *Working Paper,* no. 34, August, 2009

[246] Guillermo Ortíz (Chair), "General Discussion: Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes," *Kansas City Fed Symposium*, 2003, p. 225

economists talk about imbalances, financial and *real*, and point to imbalances independent of price stability. Mishkin, on the other hand, stressed the *financial* side of the economy, seen as largely unrelated to monetary policy. Thus, according to the latter perspective, the task of addressing financial imbalances is better left off to "prudential" supervision of financial institutions to prevent financial stress from playing a disturbing role.

The "financial instability" approach is to some degree compatible with the two other perspectives. In the first version, price stability is seen as the norm, but long periods of stability can induce risk-taking. Greenspan seems to adhere to such a view:

> "[P]roduct price stability does not guarantee either the maintenance of financial market stability or maximum sustainable growth. As recent experience attests, a prolonged period of price stability does help to foster economic prosperity. But, as we have also observed over recent years, as have others in times past, such a benign economic environment can induce investors to take on more risk and drive asset prices to unsustainable levels."[247]

To phrase it along the lines of Minsky, "good times induce balance sheet adventuring."[248] In the words of Greenspan, during the second half of the 1990s, "measures of risk had fallen to historic lows as businesspeople, having experienced years of continuous good times, assumed, not unreasonably, that the most likely forecast was more of the same."

The monetary equilibrium framework can be combined with the Minsky approach to form a different vision of macroeconomics, in which stable prices is largely irrelevant as an indicator of overall stability. Rather, the focus is on monetary excesses (during the boom phase) and shortfalls (during the ensuing recession in the wake of the bust). Both scenarios are believed to spur widespread imbalances, both real and financial. Lately, William White has advocated a new direction for macroeconomics partly along these lines.[249]

Mishkin has been a leading proponent of the inflation targeting approach to monetary policy, and thus largely represents the price stability camp outlined in the introduction. He has written extensively on the issue, some of it in collaboration with Ben Bernanke.[250] This perspective gives rise to strong policy implications regarding monetary policy and asset prices. Before becoming a central banker himself, Bernanke's academic views led him to

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[247] Greenspan, "Monetary policy and the economic outlook," Testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999
[248] Minsky, *Stabilizing an Unstable Economy*, 2008, p. 48
[249] William White, "Modern Macroeconomics Is on the Wrong Track," *Finance and Development*, International Monetary Fund, December, 2009
[250] Ben S. Bernanke and Frederic S. Mishkin, "Inflation Targeting: A New Framework for Monetary Policy?," *Journal of Economic Perspectives* vol. 11, no. 2, 1997, pp. 97-116; Ben S. Bernanke, Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen, *Inflation Targeting: Lessons from the International Experience*, Princeton University Press, 1999

believe that "[c]entral banks should adjust monetary policy actively and pre-emptively to offset incipient inflationary or deflationary pressures," but "should not respond to changes in asset prices, except insofar as they signal changes in expected inflation."[251] In his mind, "the inflation-targeting approach gives a specific answer to the question of how central bankers should respond to asset prices: changes in asset prices should affect monetary policy only to the extent that they affect the central bank's forecast of inflation." In other words, if the Fed, through its foresight, is able to predict some spillover effects from asset prices into consumer prices, it should change its interest rate. However, "there should be no additional response of monetary policy to asset-price fluctuation."[252]

In 2002, Bernanke expanded upon this perspective, saying that the Fed should use "the right tool for the job." Making use of monetary policy to address the problem of asset bubbles would be like trying to "perform brain surgery with a sledge hammer." He added that the Fed and other regulators "should insist that banks be well capitalized and well diversified and that they stress-test their portfolios against a wide range of scenarios." Moreover, the Fed could "contribute to reducing the probability of boom-and-bust cycles occurring in the first place, by supporting such objectives as more transparent accounting and disclosure practices and working to improve the financial literacy and competence of investors."[253]

Confronting the Consensus

Among the participants at the 2003 Jackson Hole symposium who to some degree sided with BIS economists Borio and White on the issue of using monetary policy to address the build-up of imbalances was Michael Mussa, who served as Director of the Department of Research at the International Monetary Fund from 1991 to 2001. He cited the case of Japan in the 1980s as a "poster child for discussing why monetary policy should, in selected instances, pay serious attention to asset-price distortions," stressing that the inflation rate in Japan remained very low in the pre-crisis years. At the same time there was "an enormous explosion of asset prices, real estate prices, and enormous growth of credit." Once such a bubble collapsed, "there was going to be serious macroeconomic problems."[254] In the late 1990s, Mussa and other IMF officials were monitoring American developments "very carefully" because they were "concerned that asset-price equities were overvalued and a downward correction might

[251] Ben S. Bernanke and Mark Gertler, "Monetary Policy and Asset Price Volatility," *Kansas City Fed Symposium*, 1999, pp. 77-128
[252] Ben S. Bernanke and Mark Gertler, "Should Central Banks Respond to Movements in Asset Prices?," *American Economic Review*, vol. 91, issue 2, 2001, pp. 253-257
[253] Bernanke, "Asset-Price 'Bubbles' and Monetary Policy," 2002
[254] Guillermo Ortíz (Chair), "General Discussion," *Kansas City Fed Symposium*, 2003, p. 226

hurt the economy." They discussed whether the monetary expansion undertaken in response to the Russian default of 1998 was overextended into 1999, fuelling the bubble. Mussa took issue with the Fed view, saying that the "notion that central banks never are in a situation where they can perceive a distortion on the upside in asset markets that recommends some type of preemptive action is too strong a conclusion to draw." When indicators are "pointing to something developing that might look like Japan, then you want to be very careful to take serious account of that."[255]

Two years later another IMF official, Chief Economist Raghuram Rajan, took issue with another aspect of the prevailing consensus, this one also related to financial stability. In presenting the paper "Has Financial Development Made the World Riskier?" at Jackson Hill, he challenged the validity of the "Greenspan doctrine," a set of beliefs which held that financial innovation during the Great Moderation in the main had contributed to reducing risk, while increasing the overall efficiency and robustness of the economy. He questioned whether financial developments have "come at a cost" and, moreover: "How concerned should central bankers and financial system supervisors be, and what can they do about it?"[256]

Rajan pointed to "altered managerial incentives," which, in turn, altered the "nature of risks undertaken by the system, with some potential for distortions." In addition to incentives encouraging "herd behavior" and excessive risk-taking, he pointed to some of the dangers that can arise when interest rates are held low for extended periods of time: "An environment of low interest rates following a period of high rates is particularly problematic, for not only does the incentive of some participants to 'search for yield' go up, but also asset prices are given the initial impetus, which can lead to an upward spiral, creating the conditions for a sharp and messy realignment."[257]

These developments would induce more procyclicality into the system—that is, amplify the boom and the bust—and might also "create a greater (albeit still small) probability of a catastrophic meltdown." Thus "monetary policy should be informed by the effect it has on incentives, and the potential for greater procyclicality of the system."[258]

As with Borio and White challenging central elements of the prevailing consensus in 2003, Fed officials voiced misgivings with the general message presented. In a prepared commentary to Rajan's paper, Governor Donald Kohn defended Greenspan's views on

[255] Guillermo Ortíz (Chair), "General Discussion," *Kansas City Fed Symposium*, 2003, p. 226
[256] Raghuram G. Rajan, "Has Financial Development Made the World Riskier?," *Kansas City Fed Symposium*, 2005, p. 313
[257] Rajan, *Kansas City Fed Symposium*, 2005, p. 317
[258] Rajan, *Kansas City Fed Symposium*, 2005, p. 318

financial market developments. He started off with stressing that his perspective "has been very much influenced by observing Alan Greenspan's approach to the development of financial systems and their regulation over the past 18 years," adding that "the Greenspan doctrine […] has reflected the chairman's analysis and deeply held belief that private interest and technological change, interacting in a stable macroeconomic environment, will advance the general economic welfare." Greenspan had welcomed the advent of new technologies and new instruments in financial markets, and the "Greenspan doctrine holds that these developments, on balance, improve the functioning of financial markets and the real economies they support." These developments had made financial institutions "more robust" and also "made the financial system more resilient and flexible—better able to absorb shocks without increasing the effects of such shocks on the real economy."[259]

This robustness would seem to be another argument for why monetary policymakers could let imbalances go unheeded. The overall costs to the economy might not be that great. Moreover, Kohn suggested that developments in financial markets had contributed to the overall stability witnessed during the Greenspan years:

> "[I]ndustrial economies have been marked by much less variability in output and inflation over the past 20 years. Many reasons have been given for this so-called great moderation, but developments in financial markets have likely played a role in making the economy more resilient. As a consequence […] problems in the financial sector are less likely to intensify shocks hitting the economy and financial market."[260]

It would seem that the Greenspan notion of stabilizing developments in financial markets had become an integral part of the overall Fed consensus on the Great Moderation. An example of the new resilience was to be found in the "experience of 2001-2003," in which "[u]nusually large declines in equity prices and increases in defaults and risk spreads" had "reduced wealth and raised the cost of capital but did not aggravate the downturn by impinging on the flow of funds." In other words, a financial bust had not brought on a credit crunch, and had seemingly smaller spillover effects into the overall performance of the real economy than otherwise could have been expected. The recession in the wake of the crash was among the mildest and shortest on record. However, the dotcom bust brought with it other major concerns, notably the perceived threat of deflationary forces taking hold of the economy.

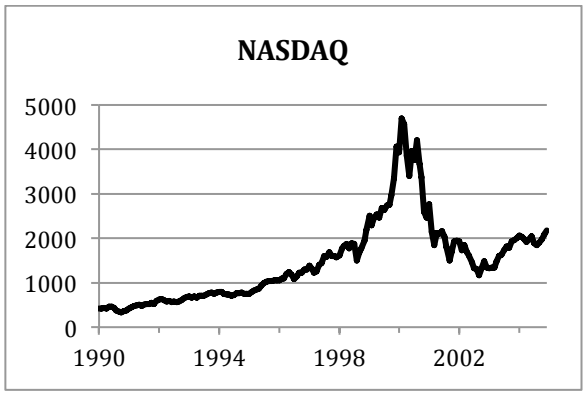
[259] Donald L. Kohn, "Commentary: Has Financial Development Made the World Riskier?," *Kansas City Fed Symposium*, 2005, pp. 371-79
[260] Donald L. Kohn, "Commentary," *Kansas City Fed Symposium*, pp. 373-74

6. FEAR OF DEFLATION: THE DOTCOM BUST AND JAPAN'S GREAT RECESSION

> "With inflation rates now quite low in the United States, however, some have expressed concern that we may soon face a new problem—the danger of deflation, or falling prices."[261]
>
> —Ben Bernanke (2002)

A series of financial crises rattled world markets from 1997 and into the new millennium. As discussed in the previous chapter, these events led to important shifts in U.S. monetary doctrines and practices, as new emphasis was given to financial stability. Eventually the U.S. itself experienced a devastating stock market plunge, starting in 2000. The technology-heavy stock index NASDAQ was hit especially hard. (See figure 6.1.)

Figure 6.1 Tech Equity Prices, 1990-2005



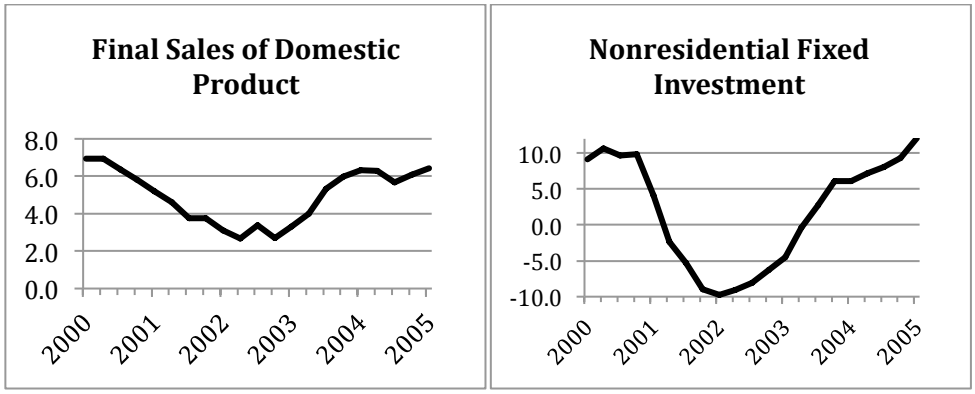
Source: Yahoo Finance (NASDAQ Index)

In March 2001, the *Wall Street Journal* reported that investors in NASDAQ shares had lost more than $3.6 trillion, a figure larger than the entire U.S. stock market twenty years earlier.[262] The crash was associated with a drop in spending, leading to an economic downturn. One measure of nominal spending is final sales of domestic product, which decelerated from March 2000 to mid-2002. (See figure 6.2a.) The drop in activity was especially pronounced in nonresidential fixed investment, which fell from an annualized growth rate of around 10 % in the first three quarters of 2000 to around negative 10 % in late 2001. (See figure 6.2b.)

[261] Ben S. Bernanke, "Deflation: Making Sure 'It' Doesn't Happen Here," remarks before the National Economists Club, Washington, D.C., November 21, 2002

[262] *Wall Street Journal*, "How Nasdaq's Mighty Have Fallen," March 5, 2001; cited in Hetzel (2008), p. 241

Figure 6.2 (a-b) Nominal Spending and Private Nonresidential Fixed Investment, 2000-2004



Source: St. Louis Fed, FRED (FINSAL, PNFI; % change from a year ago)

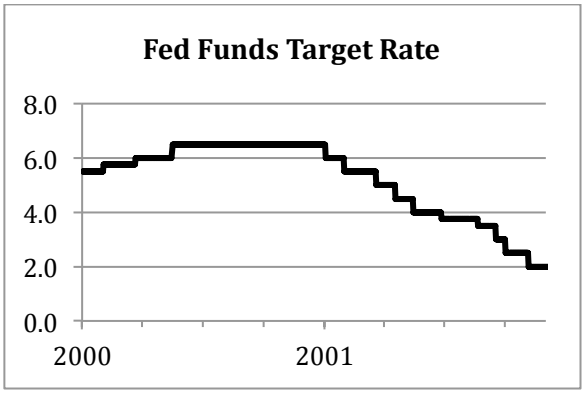
The FOMC responded somewhat hesitatingly to these developments. It had raised the fed funds target rate to 6.5 percent at its May 2000 meeting, and decided to keep it there throughout the year. The first sign of a policy reversal appeared on December 19. An assessment of economic indicators prepared for the FOMC meeting pointed to continued tight labor market conditions. However, Fed staff forecasting made a "substantial downward revision" of economic activity, projecting a slow-down to 2.25 percent output growth in the first quarter of 2001. Activity was expected to "pick up in the spring."[263]

As late as November 2000, policymakers still worried of "persisting risks of heightened inflation pressures" despite "clear indications of more moderate expansion in economic activity." In their assessment, these circumstances called for "a steady monetary policy" to promote the dual goal of price stability and sustainable growth. By December, "the risks of higher inflation had diminished materially," but not enough to contemplate a rate cut. However, the balance of risks pointed "toward conditions that could generate economic weakness in the foreseeable future."[264] The FOMC issued a policy statement pointing to "stress in some segments of the financial markets," suggesting that the economy might be "slowing further."[265]

The committee soon shifted its policy stance, engaging in a dramatic rate cut exercise that would bring the fed funds rate down to 1.75 percent in less than a year. (See figure 6.3.) The first move came on January 3, 2001, when the FOMC decided to cut the target rate by 0.5 percentage points while stating that "the risks are weighted mainly toward conditions that may generate economic weakness in the foreseeable future."[266]

[263] *Beige Book,* p. vi, and *Greenbook*, p. I-1, prepared for FOMC meeting December 19, 2000
[264] *Minutes*, December 19, 2000; discussion of November FOMC meeting cited here
[265] *Statement*, December 19, 2000
[266] *Statement*, January 3, 2001

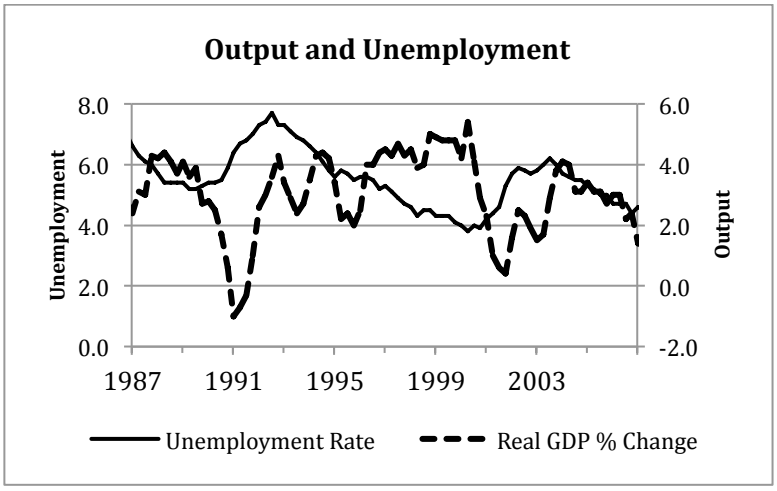
Figure 6.3 Monetary Policy Rate, 2000-2001



Source: St. Louis Fed, FRED (DFEDTAR)

The recession in the wake of the dotcom crash was remarkably mild, if measured in output. Still there was something unusual going on, as the employment rebound took a long time to gather pace. In fact, the economy seemed to experience a "jobless recovery," as had happened in the recession of the early 1990s.[267] (See figure 6.4.)

Figure 6.4 Real GDP Growth and Unemployment, 1987-2006



Source: St. Louis Fed, FRED (GDPC1) and Department of Labor, Statistics

Even though economic growth recovered, there were discomforting signs of weakness in the post-crash years that FOMC members took notice of in their policy deliberations, including an uncertain economic atmosphere and unusual low price growth. This chapter will look at these developments and how policymakers responded to them.

[267] "The official period of recession, as dated by the National Bureau of Economic Research, lasted only eight months, from March to November of 2001. Real gross domestic product declined very modestly before resuming a moderate pace of growth […] Nevertheless, in one key aspect, namely, the performance of the labor market, the downturn was severe and the recovery has been exceptionally slow." Ben S. Bernanke, "The Jobless Recovery," remarks at the Global Economic and Investment Outlook Conference, Carnegie Mellon University, Pittsburgh, Pennsylvania, November 6, 2003

Growing Concerns

In the early 2000s, the FOMC observed a "series of blows" to the economy, including a dramatic drop in equity market values, corporate accounting scandals, and the escalation of geopolitical risks. The terror attacks on September 11, 2001 spurred monetary policymakers to cut both the fed funds target rate and the discount rate (the Fed lending rate) by 0.5 percentage points a few days later, while continuing "to supply unusually large volumes of liquidity to the financial markets, as needed, until more normal market functioning is restored."[268] The two rates were reduced another 0.50 percentage points each on October 2 as the "terrorist attacks" had "significantly heightened uncertainty in an economy that was already weak," putting a further dampening on business and household spending.[269] On November 6, both rates were cut again, by similar amounts, due to "[h]eightened uncertainty and concerns about a deterioration in business conditions both here and abroad" which were seen to be "damping economic activity."[270] On December 11, both rates were reduced again, bringing the federal funds target rate down to 1.75 percent. Economic activity was seen to remain "soft."[271]

"Despite these adversities," however, "the nation's economy emerged from its downturn in 2001 to post moderate economic growth," boosted by monetary and fiscal stimulus, as well as "unusually rapid productivity growth."[272] In 2002-2003, the economic performance appeared to be "gradually improving," but "the tentative nature of this improvement warranted the continuation of a highly accommodative stance of monetary policy." Thus the federal funds target rate was held steady at 1.75 percent during the first 10 months of 2002. On November 6, growing uncertainties led the FOMC to lower the target rate by 0.5 percentage points. In a coordinated move, the Board of Governors cut the discount rate by a similar amount. The *Statement* accompanying these decisions stressed "greater uncertainty, in part attributable to heightened geopolitical risks," inhibiting spending, production, and employment. Moreover, inflation and inflation expectations remained "well contained."[273]

Thus, with a low probability of inflationary pressures, the FOMC decided it could help the economy work its way through a "current soft spot." William McDonough, President of the Federal Reserve Bank of New York and the Vice Chairman of the Federal Open Market Committee, argued that the FOMC should take out some "insurance" against the "downside

[268] *Statement*, September 17, 2001; *Minutes*, August 21, 2001 (which includes minutes of "Intermeeting Policy Action" on September 13 and September 17, 2001)
[269] *Statement*, October 2, 2001
[270] *Statement*, November 6, 2001
[271] *Statement*, December 11, 2001
[272] *Annual Report 2002*, p. 3
[273] *Statement*, November 6, 2002

risk." He worried that the economic outlook remained uncertain, not "just by looking at the domestic economy alone," but the international situation made "the need for insurance even clearer." Growth was seen to be weak around the world, including Europe, Japan and Latin America, and there was still uncertainty as to the domestic economic outlook. Thus "the time for the Committee to act" had arrived.[274]

An incremental rate movement, however, was deemed insufficient: "When one is taking insurance against downside risks, one should take out the amount of insurance that is appropriate; 25 basis points simply is not enough." McDonough was concerned that the market would see such a move as too timid.[275] The 2002 *Annual Report* explained that the FOMC feared that "the near-term weakening could become entrenched."[276] Thus a preemptive move in order to forestall potential problems was called for.

One month later, discussions centered upon a new potential threat. At the December 10 FOMC meeting, Fed staff had provided projections and different scenarios for the economic outlook. Adding to the discussions of economic weakness, they included an assessment of the likelihood of consumer price growth trending towards zero and even below. President Parry, of the San Francisco Fed, "was struck by how large that probability" was, estimated to around 28 percent. Federal Reserve economist David Stockton pointed out that the number mainly referred to "benign" deflationary pressures stemming from productivity growth. The more serious concern was "ending up in a Japanese-style deflation" with the monetary policy rate ending up at zero. That scenario had a lower probability—estimated to about 8-9 percent.[277]

President Robert McTeer of the Federal Reserve Bank of Dallas, believed that the committee's "aggressive move" at the November meeting, when the target rate was lowered by 0.5 percentage points, was the "needed preemptive strike" to contain these contractionary pressures.[278] However, half a year later, the FOMC saw the need to move preemptively once more to perceived downside risks.

At the June 25, 2003 committee meeting, the word "deflation" was mentioned 100 times. Vincent Reinhart, director of the Federal Reserve Board's Division of Monetary Affairs, saw it prudent to come up with a contingency plan—"Conducting Monetary Policy at Very Low Short-term Interest Rates." He noted that "the current nominal federal funds rate of 1¼

[274] *Transcript*, November 6, 2002, pp. 62-63
[275] In the words of McDonough: "First of all, the immediate market reaction to 25 basis points slanted toward weakness would be that the Committee is composed of a bunch of wimps, which is not an attractive assessment for a group that is supposed to be a very important public body." Transcript, November 6, 2002, p. 85
[276] *Annual Report 2002*, p. 4
[277] *Transcript*, December 10, 2002, p. 22
[278] *Transcript*, December 10, 2002, p. 47

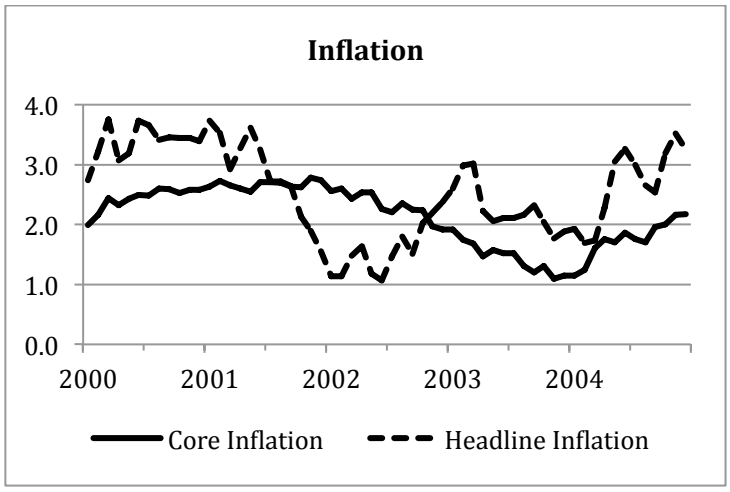
percent places the Committee in a region it has not been in a half century." He outlined "policy alternatives that may help to ensure that monetary policy remains potent," in case interest rates reached the lower zero bound.[279]

Even though economic indicators pointed to "a firming in spending, markedly improved financial conditions, and labor and product markets that are stabilizing," weak consumer price growth led the FOMC to cut the already historically low fed funds target rate from 1.25 to 1 percent, stating that "the probability, though minor, of an *unwelcome substantial fall in inflation* exceeds that of a pickup in inflation from its already low level."[280] (Emphasis added.) Looking back, Greenspan explained the rationale behind the policy action:

> "At the FOMC meeting in late June, where we voted to reduce interest rates still further, to 1 percent, deflation was Topic A. We agreed on the reduction despite our consensus that *the economy probably did not need yet another rate cut*. The stock market had finally begun to revive, and our forecasts called for much stronger GDP growth in the year's second half. Yet we went ahead on the basis of a *balancing of risk*. We wanted to shut down the *possibility of corrosive deflation*; we were willing to chance that by cutting rates *we might foster a bubble*, an inflationary boom of some sort, which we would subsequently have to address."[281] (Emphasis added.)

In the early 2000s, headline inflation fluctuated between 1 and 4 percent, which in part can be explained by movements in international oil prices. More importantly, core inflation trended gradually downwards from early 2002 to late 2003. (See figure 6.5.) During this time, monetary policymakers went through a brief deflation scare.

Figure 6.5 Consumer Prices, 2000-2004



Source: St. Louis Fed, FRED (CPIACUNS, CPILFENS; % change from a year ago)

[279] *Transcript*, June 24-25, 2003, pp. 3-4
[280] *Statement*, June 25, 2003
[281] Greenspan, *Age of Turbulence*, 2007, p. 229

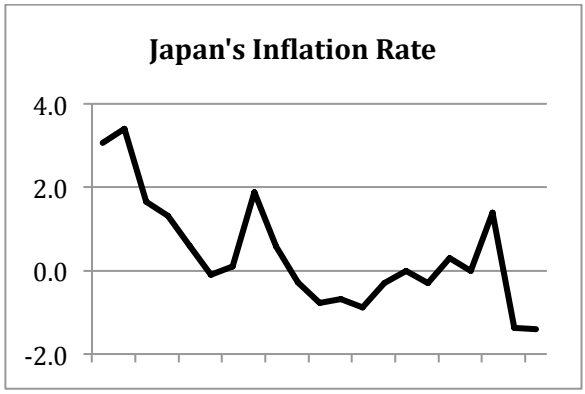
Lessons from the Past and the Present

The long gone specter of deflation—not seen in the U.S. since the crisis-ridden 1930s—was now perceived as a potential, though unlikely, threat. In the words of Greenspan, "[u]ntil recently, this topic was often regarded as an academic curiosity. Indeed, a decade ago, most economists would have dismissed the possibility that a government issuing a fiat currency would ever produce too little inflation. However, the recent record in Japan has reopened serious discussion of this issue."[282] Fed policymakers were increasingly concerned with financial and economic developments taking place in Japan, worrying about the implications for the post-crash U.S. economy.[283] In the words of Bernanke:

> "With inflation rates now quite low in the United States […] some have expressed concern that we may soon face a new problem—the danger of deflation, or falling prices. That this concern is not purely hypothetical is brought home to us whenever we read newspaper reports about Japan, where what seems to be a relatively moderate *deflation*—a decline in consumer prices of about 1 percent per year—has been associated with years of painfully slow growth, rising joblessness, and apparently intractable financial problems in the banking and corporate sectors."[284]

In 1990, Japan experienced a similar asset bust to that of the U.S. ten years later. Japanese stock and real estate prices went into a protracted decline. At the same time, consumer price growth started trending downwards (See figure 6.6.)

Figure 6.6 Japan's Inflation Rate, 1990-2010



Source: International Monetary Fund, World Economic Outlook Database, April 2010

[282] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 2003 (2), p. 49
[283] In the words of Fed Vice Chairman Ferguson: "All of us around the table have thought about the situation in Japan for a long period of time." *Transcript*, June 24-25, 2003, p. 20
[284] Bernanke, "Deflation," 2002

From 1999 till 2002, the Japanese economy went through a period of moderate negative price growth (deflation), at the same time experiencing low growth rates.[285] Fed officials "carefully analyzed the Japanese experience of the early 1990s," concluding that "aggressively moving against the risk of deflation would pay dividends by reducing the odds on needing to deal with the zero bound on nominal interest rates should the economy be hit with another negative shock."[286] Fed Vice Chairman Roger W. Ferguson noted that U.S. core inflation was at a level "not seen on a sustained basis in almost forty years." In result, market commentators were worrying that the U.S. might "follow Japan into a deflationary slump." Still, he did not expect the U.S. to experience sustained deflation. Such a scenario had a low probability. But should it come about, the consequences could be grave as "a sustained fall in prices will transform what might otherwise be a manageable level of nominal debt accumulated by businesses and households into a rising and potentially debilitating level of real debt and real debt service costs." Such developments could lead to "widespread defaults, bankruptcies, and bank failures, with potentially devastating consequences for the entire financial system."[287]

Such a scenario is referred to as "debt-deflation"—"the deflation-induced, ever-increasing real value of debts," as described by Bernanke.[288] This analysis was influenced by the writings of Irving Fisher, a monetary economist who developed a "debt-deflation" theory of the Great Depression in 1933. The major causes of the boom-bust cycle, according to Fisher, are "the debt disease" and "the price level disease."[289] Deflation increases the real value of debt, impairing the overall workings of the economy. He suggested that these deflationary forces could be offset by monetary measures.

In 2002, Ben Bernanke held a speech before the National Economists Club in Washington D.C., outlining which measures the monetary authorities could resort to in order to contain deflationary pressures, should they arise. He assured his audience that "under a paper-money system, a determined government can always generate higher spending and hence positive inflation."[290] The speech, entitled "Deflation: Making Sure 'It' Doesn't Happen Here," presented a set of beliefs that was dubbed the "Bernanke doctrine."

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[285] Federal Reserve Bank of Cleveland, "Deflation," *Annual Report 2002*
[286] Donald L. Kohn, "John Taylor Rules," speech at the Conference on John Taylor's Contributions to Monetary Theory and Policy, Federal Reserve Bank of Dallas, Dallas, Texas, October 12, 2007
[287] Roger W. Ferguson, Jr., "Uncertain Times: Economic Challenges Facing the United States and Japan," remarks before the Japan Society, New York, New York, June 11, 2003
[288] Ben S. Bernanke, "Deflation: Making Sure 'It' Doesn't Happen Here," remarks before the National Economists Club, Washington, D.C., November 21, 2002
[289] Irving Fisher, "The Debt-Deflation Theory of Great Depressions," *Econometrica* 1 (4), 1933, pp. 337-57
[290] Bernanke, "Deflation," 2002

Bernanke's views on depressions and how to address deflationary forces can moreover be traced back to a certain understanding of the economic crisis of the 1930s that focuses almost solely on the "monetary mistakes" made by the Federal Reserve from the late 1920s onwards while ignoring the imbalances building up in the preceding years. This view is associated with Milton Friedman's "Monetarist" explanation of the Great Depression, of which "the direct and indirect influences […] on contemporary monetary economics would be difficult to overstate," according to Bernanke. These perspectives were presented in Milton Friedman and Anna J. Schwartz' *A Monetary History of the United States* (1963), "the leading and most persuasive explanation of the worst economic disaster in American history."[291] The authors labeled the period from 1929 to 1933 the "Great Contraction," based on the fact that the broader money supply contracted by approximately 1/3 along with a severe contraction in output.[292]

The interpretation of the Great Depression, shared by Bernanke and Friedman, played into their understanding of what went wrong in Japan in the 1990s. Milton Friedman juxtaposed the monetary "mistakes" of the Bank of Japan in the 1990s with what he perceived as the "successful" Fed policies in response to the dotcom crash, comparing both to the policy response in the wake of the Great Crash of 1929. He viewed these three episodes as a "natural experiment in monetary policy."[293]

Friedman thought that the lack of a monetary response to the downturn of the early 1930s was the main cause of the Great Contraction, asserting that this episode could have been avoided if only the Fed had expanded the monetary base and cut interest rates rapidly once the crisis hit. As he wrote in *A Monetary History*, "this contraction is in fact a tragic testimonial to the importance of monetary forces."[294] In the case of Japan, Friedman thought the monetary authorities responded too late and too timidly. In the wake of the dotcom crash, however, U.S. monetary authorities seemed to have taken the correct course of action, promptly cutting interest rates and expanding the monetary base.

By looking at economic indicators in the years following these three major crashes, Friedman concluded that the "results of this natural experiment are clear," asserting that monetary responses explain "what happens to national income and to stock prices," that is, the depth of the crises and the speed and strength of the recovery, both in the real economy and in

[291] Ben S. Bernanke, "On Milton Friedman's Ninetieth Birthday," remarks at the Conference to Honor Milton Friedman, University of Chicago, Chicago, Illinois, November 8, 2002
[292] Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960*, National Bureau of Economic Research/Princeton University Press, 1963
[293] Milton Friedman, "Why Money Matters," *Wall Street Journal*, November 17, 2006
[294] Friedman and Schwartz, *A Monetary History*, 1963, p. 300

financial markets. These episodes thereby supported "the view that monetary policy deserves much credit for the mildness of the recession that followed the collapse of the U.S. boom in late 2000."[295]

The strong Fed response in the wake of the dotcom crash led to a robust rebound of financial markets, whereas in the case of Japan, stock markets went into a long period of decline. As for the 1930s, "the S&P index started falling away" from the stock market developments of the two other episodes "under the influence of a collapsing money stock." In other words, the dismal performance of financial markets was caused by too weak monetary growth. This could in turn imply that the problem was not so much rising stock prices in the boom as the lack of a monetary response to help asset prices rebound after the bust.

The monetarist analysis of the U.S. economy in the interwar years led several economists to question whether there was in fact an unsustainable investment boom in 1920s. Writing in 1987, Anna J. Schwartz held that had "employment and economic growth continued, stock prices could have been maintained."[296] Turning conventional wisdom on its head, Friedman and Schwartz attributed the outbreak of the crisis to undue monetary tightening in 1928-29 caused by the desire to "curb the stock market boom," stressing that the Fed "should not have made itself an arbiter of security speculation or values and should have paid no direct attention to the stock market boom."[297]

The implications of these interpretations are clear: The Fed should not try to lean against what it perceives as asset bubbles, because it could be mistaken in trying to identify a bubble. Furthermore, this tightening would risk setting off a severe recession and, in the worst case, a depression, like in the 1930s, or a protracted period of stagnation, like Japan's "Lost Decade" of the 1990s.

This line of thought resonated well with Bernanke's own thinking on the subject. In a speech, given before the National Association for Business Economics in New York in 2002, he cites the Fed's attempt at leaning against the 1920s asset bubble as a cautionary tale. The protagonist of this monetarist-inspired story is Benjamin Strong, Governor of the New York Fed, who acted on his own initiative as an informal head of the Federal Reserve System until he died in 1928. Strong resisted the siren calls of those who wanted to halt the speculative boom on Wall Street, because "any policy directed solely to forcing liquidation" in the stock

[295] Friedman, "Why Money Matters," 2006
[296] Anna J. Schwartz, *Money in Historical Perspective*, University of Chicago Press, 1987, p. 130
[297] Friedman and Schwartz, *A Monetary History*, p. 290, 1963

market "will be found to have a widespread" effect, "mostly to the detriment of the healthy prosperity of this country."[298]

However, when Strong died in 1928, the leadership of the Fed went into the hands of those who "pushed for higher interest rates." The Fed discount rate was raised from 3.5 percent in 1928 to 6 percent in August 1929. The stock market peaked the following month and fell sharply in October as panicky sales drove down stock prices. The economic downturn actually started two months before the Great Crash. From this story of monetary mismanagement, Bernanke draws what to him seems like an inescapable conclusion:

> "The correct interpretation of the 1920s, then, is not the popular one—that the stock market got overvalued, crashed, and caused a Great Depression. The true story is that *monetary policy tried overzealously to stop the rise in stock prices*. But the main effect of the tight monetary policy, as Benjamin Strong had predicted, was to slow the economy—both domestically and, through the workings of the gold standard, abroad. The slowing economy, together with rising interest rates, was in turn a major factor in precipitating the stock market crash."[299] (Emphasis added.)

To back up his claim, in addition to making the usual references to Friedman and Schwartz, Bernanke drew intellectual support from John Maynard Keynes, who in 1930 concluded that the "high-market rate of interest" which was set by the Fed prior to the collapse "in their effort to control the enthusiasm of the speculative crowd," (that is, to curb the speculative boom) "played an essential role in bringing about the rapid collapse." Thus Keynes attributed "the slump of 1930" primarily to high interest rates and their "deterrent effects on investment," and "only secondary to the collapse itself."[300]

For Bernanke, the first lesson of the Great Depression then was never trying to burst a bubble, as this could have severe consequences for the rest of the economy. He made a similar observation regarding the Japanese financial crash of the early 1990s and subsequent lost decade: "The only place that monetary policy played a role was that in 1989 [the Bank of Japan] intentionally tried to prick the bubble." He added that the central bank did in fact "succeed in pricking the bubble. Asset prices collapsed and they had a 14-year depression."[301]

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[298] Strong quoted in Lester V. Chandler, *Benjamin Strong, Central Banker*, Washington D.C., Brookings Institution, 1958, p. 427; cited in Bernanke, "Asset-Price 'Bubbles' and Monetary Policy," 2002, footnote 13

[299] Bernanke, "Asset Price 'Bubbles' and Monetary Policy," 2002

[300] John Maynard Keynes, *A Treatise on Money*, vol. II, London, Macmillan, 1930, p. 196; quoted in Bernanke, "Asset Price 'Bubbles' and Monetary Policy," 2002, footnote 16

[301] Guillermo Ortíz, (Chair), "General Discussion: Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes," *Kansas City Fed Symposium*, 2003

The second major lesson: if a bubble bursts, do not let the money supply contract and deflationary tendencies get hold of the economy—in line with the monetarist interpretation of the Great Contraction as a result of "a number of serious additional mistakes that deepened and extended the Great Depression of the 1930s." The worst of these mistakes, the Fed "permitted a severe deflation in the price level, which drove real-interest rates sky-high and greatly increased the pressure on debtors"—in line with the emphasis of "debt-deflation" as a major concern in such contractionary episodes.

Thus the links between Fed beliefs on asset bubbles and deflation become clear. By moving to curb an asset boom, the central bank can inadvertently set off severe recessionary forces, which, if not checked, can give rise to deflation. Hence the need to move preemptively against both financial fallouts and potential contractionary forces impeding the economy in the wake of asset busts. These motives seem to have come together in the early 2000s, leading to new directions in the development of policymakers' understandings of the economy, in turn leading to new monetary practices.

Bernanke concluded his cautionary tale on an optimistic note, saying that a "small compensation for the enormous tragedy of the Great Depression is that we learned some valuable lessons about central banking. It would be a shame if those lessons were to be forgotten." In his "Deflation" speech, presented around the same time, Bernanke seemed confident that the Fed had learned this lesson well and would always be able to stop deflation, implying that Fed officials could stimulate the economy back on track. Worries about falling into a Japanese style trap were largely brushed aside, if only monetary policymakers took heed of the lessons learned from past deflationary episodes.

According to Bernanke, the "sources of deflation are not a mystery." It is "in almost all cases a side effect of a collapse of aggregate demand—a drop in spending so severe that producers must cut prices on an ongoing basis in order to find buyers. Likewise, the economic effects of a deflationary episode, for the most part, are similar to those of any other sharp decline in aggregate spending—namely, recession, rising unemployment, and financial stress."[302]

The concern with containing the fallout of asset busts and their after effects—as opposed to considering both the imbalances of the boom, as well as the distress of the bust—led increasingly to a distinct mode of operation from the late 1990s and throughout the period under investigation and has characterized Alan Greenspan's "risk management paradigm."

[302] Bernanke, "Deflation," 2002

Risk Management Paradigm

Speaking at the Jackson Hole symposium in 2003, Alan Greenspan presented some of his core beliefs on Fed policymaking. The speech, entitled "Monetary Policy under Uncertainty," was an attempt at creating some kind of philosophical reasoning for the mode of action the Fed had entered into during his long-lasted tenure. He started the speech on a Hayekian note, emphasizing the role of uncertainty in decision-making. The importance of limited knowledge was a main staple of the social philosophy of the Austrian-born economist F.A. Hayek.[303] For Greenspan this human limitation was a basic premise of monetary decision-making: "Uncertainty is not just an important feature of the monetary policy landscape; it is the defining characteristic of that landscape."[304]

He added that every "model, no matter how detailed or how well designed conceptually and empirically, is a vastly simplified representation of the world that we experience with all its intricacies on a day-to-day basis." From this, he concluded, "even with large advances in computational capabilities and greater comprehension of economic linkages, our knowledge base is barely able to keep pace with the ever-increasing complexity of our global economy."[305] Greenspan then turned this Hayekian reasoning around into a philosophical justification of discretionary authority:

> "[G]iven our inevitably incomplete knowledge about key structural aspects of our ever-changing economy and the sometimes asymmetric costs of benefits of particular outcomes, a central bank seeking to maximize its probability of achieving its goals is driven, I believe, to a risk-management approach to policy."[306]

By "risk-management," Greenspan was thinking specifically of how the FOMC should conduct monetary policy by weighing in the risks of different scenarios that could materialize in the short run. If a certain outcome was seen as especially daunting, then this scenario should be avoided, even if the chances of it coming to pass were slim. Applying this policy framework to the perceived, though remote, threat of deflation, the implications from this line of reasoning were clear: "These considerations have inclined Federal Reserve policymakers

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[303] Early formulations of what has been described as the "knowledge problem" can be found in "Economics and Knowledge" (1936) and "The Use of Knowledge in Society" (1945), reprinted in F.A. Hayek, *Individualism and Economic Order*, University of Chicago Press, 1996

[304] Alan Greenspan, "Monetary Policy under Uncertainty," *Kansas City Fed Symposium*, 2003

[305] In the1960s, Greenspan developed "Austrian" sympathies, advocating a return to the classical gold standard. He remained somewhat sympathetic to this school of thought, expressing at the turn of the millennium that "the Austrian school have reached far into the future from when most of them practiced and have had a profound and, in my judgment, probably an irreversible effect on how most mainstream economists think in this country." Alan Greenspan, "Hearings," before the U.S. House of Representatives' Committee on Financial Services, Washington D.C., July 25, 2000

[306] Greenspan, "Monetary Policy under Uncertainty," *Kansas City Fed Symposium*, 2003

toward policies that limit the risk of deflation *even though* the baseline forecasts from most conventional models *would not* project such an event." (Emphasis added.)

In other words, since models are not to be relied upon, and since certain outcomes should be avoided, it followed that to be on the safe side, potential threats of financial fallouts and deflationary pressures should be preempted through monetary easing. To avoid such outcomes, it would be necessary to "undertake actions intended to provide some insurance against the emergence of especially adverse outcomes." This "insurance" policy was the explicit rationale given by Greenspan to "ease policy" when, for instance, the Russian debt default rattled financial markets in 1998. This monetary expansion was conducted despite the FOMC's "perception that the economy was expanding at a satisfactory pace and that, even without a policy initiative, was likely to continue to do so," because monetary policymakers "were concerned about the low-probability risk that the default might severely disrupt domestic and international financial markets, with outsized adverse feedback to the performance of the U.S. economy."[307]

The sole cost imputed into this "insurance" was a "risk of higher inflation at some future date," a cost that "was viewed as relatively low at the time, largely because increased competition, driven by globalization, thwarted employer's ability to pass through higher labor costs into prices." In other words, changes in the global economy had put a lid on inflationary forces, tipping the balance of risk towards downside threats.

There is no mention of how such policy practices could affect asset prices. Neither is there mention of how this "insurance" could lead to unforeseeable problems in the future by changing incentives among financial market participants, a main concern raised by Raghuram Rajan at the 2005 Jackson Hole symposium. Moreover, Greenspan points to a central cause of the increasingly lowered interest rates during this period, namely that increased globalization put downward pressure on consumer prices, thereby making it possible for the Fed to hold interest rates at exceedingly low levels, without risking a return of inflation or rising inflationary expectations. Greenspan's "risk-management" practices were thereby facilitated by external developments taking place in the global economy, as well as domestic productivity gains which contributed to keep consumer prices in check during a period of monetary ease.

[307] *Minutes*, September 29, 1998; cited in Greenspan, "Monetary Policy under Uncertainty," *Kansas City Fed Symposium*, 2003

Good vs. Bad Deflation

At the December 10, 2002 FOMC meeting, President Gary Stern of the Minneapolis Fed suggested a different view on deflation: "It seems to me that, with strong productivity improvement under way in two very, very large economies, the United States and China, and given what that implies for pressure on producers in some other countries, downward price pressure around the world should not be unexpected."[308] In other words, there were two contrary deflationary scenarios. In the one case, exemplified by China, falling consumer prices were associated with strong economic growth. In the other case, exemplified by Japan, falling consumer prices seemed to be associated with a protracted recession.

Monetary economists Michael Bordo and Andrew Filardo took note of the Fed's new vigilant approach towards deflation in the early 2000s, replacing the earlier concern with inflation "as public enemy number one."[309] They acknowledged the damaging effects of the deflationary pressures during the 1930s and similar episodes. However, they also made the distinction between different *kinds* of deflation. There are the "bad" and "ugly" kinds, associated with sudden contractions in money and credit, but there is also the "good" kind, which in the past has been associated with periods of high productivity growth and rising prosperity. After all, the U.S. experienced a long period of falling prices in the decades following the American Civil War, at the same time witnessing rapid industrialization.

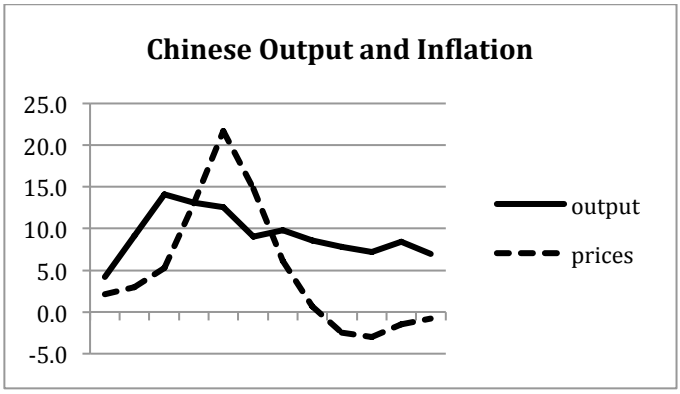
As pointed out by the Federal Reserve Bank of Cleveland, "from 1880 to 1896, the wholesale price level in the United States fell 30 percent—nearly 2 percent per year. Far from being a period of gloom and doom, this deflation accompanied a period of relative prosperity: Real income increased 85 percent over this time span, nearly 5 percent per year."[310] The more recent example of China will help to further illuminate this important point of "growth deflation." From 1998 to 2002, Chinese real output grew at 7-8 percent per year. At the same time consumer prices fell on average by about 1-3 percent per year. (See figure 6.7.)

A major point is that price deflation caused by productivity gains and rising output should not be conflated with debt deflation and severe crises. Furthermore, the deflation associated with the latter kind of episodes does not testify to the causes of these crises: "Although the weight of professional opinion favors the idea that deflation played a central role in the Great Depression, the claim that price deflation was the initial *cause* is less obvious." The 13.1 percent drop in output during the first year of the crisis "was accompanied by almost no price

[308] *Transcript*, December 10, 2002, p. 45
[309] Michael Bordo and Andrew Filardo, "Deflation and monetary policy in a historical perspective: remembering the past or Being Condemned to Repeat It?," *NBER Working Paper*, no. 10833, 2004
[310] Federal Reserve Bank of Cleveland, "Deflation," *Annual Report 2002*

movement." However, the rapid deflation that occurred later on certainly "played an important role in determining the magnitude and severity of the economic contraction."[311] Similarly, deflation in the case of Japan only set in several years after the initial crash.

Figure 6.7 Chinese Growth Deflation, 1990-2001



Source: Cleveland Fed, 2003 (Chinese real GNP and general retail price index)

Concerns with deflation among Fed officials seemed based on a certain set of beliefs, in which the performance of the price level is associated with expectations among market participants.[312] In such a view, expectations of low, or even negative, price growth can become entrenched, unless monetary policymakers intervene to push up expectations to the desired level. A related problem is that when interest rates come close to its lower zero bound and when price growth flatten out close to zero percent per year, there is less room to stimulate the economy, as the real fed funds rate cannot be lowered.

In 1998 Paul Krugman proposed a solution to this problem, suggesting that the Bank of Japan should "credibly promise to be irresponsible" in order to push up inflation expectations. Drawing upon the perspective of rational expectations, he came to the conclusion that the Japanese situation "fundamentally involves a credibility problem," the opposite one that central bankers usually cope with, namely to make the public believe that the central bank intends to create substantial inflation.[313] In a similar vein, Bernanke suggested that the Japanese central bank could adopt a price-level target to initiate a period of reflation, thus committing monetary policy to bring up the price level. One perceived benefit of such a

[311] Federal Reserve Bank of Cleveland, "Deflation," *Annual Report 2002*
[312] For instance, Fed Vice Chairman Ferguson wrote that "as economists have long recognized, a central bank could influence expectations of future short-term interest rates directly by committing to keeping the policy interest rate at zero for a specified and relatively long period of time or until some intermediate macroeconomic target—such as the termination of declining prices—was achieved." Roger W. Ferguson, Jr., "Uncertain Times: Economic Challenges Facing the United States and Japan," remarks before the Japan Society, New York, New York, June 11, 2003
[313] Paul Krugman, "Its baaack: Japans slump and the Return of the Liquidity Trap," *Brookings Papers on Economic Activities*, no. 2, 1998, pp. 137-205

policy would be to lower the real rate of interest by creating expectations of inflation.[314] Among FOMC members, the Bank of Japan was believed to have failed in its monetary response to deflationary pressures in that they did not commit to a policy of raising prices.[315]

In contrast, a view stressing the role of monetary disequilibrium and real imbalances, incorporating additional insights from the financial instability approach, would say that damaging deflationary pressures could set in if there are fundamental factors hampering the monetary mechanism of the economy. One such factor could be impaired balance sheets, triggering a protracted balance sheet recession. As recalled, if such a scenario materializes, monetary policy is largely rendered impotent, due to the fact that the monetary transmission mechanism breaks down. This does not seem to have been the case in the U.S. in 2003. True, stock prices experienced a dramatic decline in the wake of the dotcom bust, but the balance sheets of households were largely held intact. The corporate sector seems to have managed its way through the early 2000s, though several firms experienced large-scale losses on pension fund assets, due to the decline in stock prices.[316] No systemic problems arose in the banking sector that could adversely impact lending. In fact, stock markets recovered and the recession was surprisingly mild and short-lived. The main worry was unemployment rates tending to stay elevated for a long time coming out of the recession.

To put the early 2000s in relief to the U.S. balance sheet recession of the early 1990s, discussed in chapter 4, it is instructive to look closer at the behavior of monetary aggregates. As shown in figure 6.8, monetary base growth was brought down in 2000, as the Fed curtailed open market operations, being mostly concerned with upside risks. As the policy stance shifted going into 2001, base money growth was brought up again. The main thing to notice is the close correlation between base money and M2 from the second half of 2001 onwards. In contrast to the early 1990s, monetary easing in the early 2000s did impact wider monetary aggregates—suggesting that the economy was not facing a protracted balance sheet recession.

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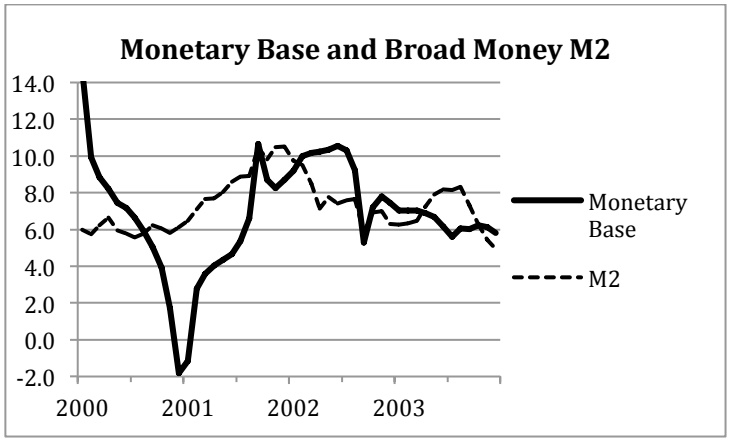
[314] Ben S. Bernanke, "Some Thoughts on Monetary Policy in Japan," remarks before the Japan Society of Monetary Economics, Tokyo, Japan, May 31, 2003

[315] *Transcript*, June 24-25, 2003, pp. 21-22

[316] In February 2003, Bernanke noted that "households and the banking system seem to be in good financial condition for this stage of the business cycle. The story for firms is more mixed, with some companies and sectors under significant financial pressure. However, […] many firms have taken advantage of low interest rates to restructure their balance sheets and most seem financially capable of undertaking new capital investment and of ramping up hiring." Ben S. Bernanke, "Balance Sheets and the Recovery," remarks at the 41st Annual Winter Institute, St. Cloud State University, St. Cloud, Minnesota, February 21, 2003

Figure 6.8 Monetary Aggregates, 2000-2003



Source: St. Louis Fed, FRED (BOGUMBNS, M2NS; % change from a year ago)

Another metric, the behavior of M2 velocity, shows a fall of around 5 percent in 2000, 3.8 percent in 2001 and 2.1 percent in 2002, suggesting some initial strains, but hardly enough to keep overall spending down coming out of the recession.[317] Yet another metric is to look at final sales of domestic product—a proxy for aggregate spending—which decelerated in 2002, before accelerating the year after, but showed positive growth all through this period. (See figure 6.2.) It would seem that there were certain financial headwinds in the early 2000s, but not enough to bring about "bad deflation," in the past associated with contractionary pressures. Moreover, low inflation could be caused by other factors related to the real side of the economy. Productivity gains and cheap imports tend to push down prices, two trends influencing economic developments at the time. In other words, the low level of inflation was not an indicator of debt deflation or a credit crunch, as had been the case in the U.S. in the early 1930s and Japan in the 1990s.

Cautious Tightening

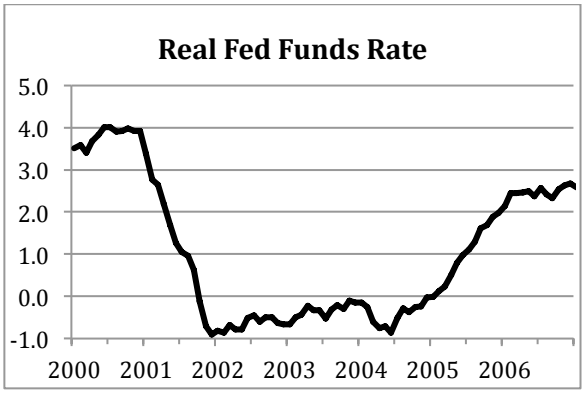
By the end of 2003, the deflation scare had subsided. At the December 9 FOMC meeting, it was noted that "with growth now seen as more assured, downward risks to inflation were viewed as considerably reduced relative to earlier in the year, and the risk of a pernicious deflation in which declining prices reinforced weakness in demand—a risk that the members had always viewed as small—was now regarded by most as virtually nil."[318]

It was not until the summer of 2004 that the Fed started raising the fed funds target rate. These hikes took the form of small and consecutive steps, 0.25 percentage points at a time,

[317] St. Louis Fed, FRED (M2V), % change from a year ago, annual observations
[318] *Minutes*, December 9, 2003

from mid-2004 until mid-2006. It took nearly two years before the fed funds rate reached 5 percent. In the preceding years, the real fed funds rate, measured as the nominal rate adjusted for headline inflation, turned negative for more than three years. (See figure 6.9.)

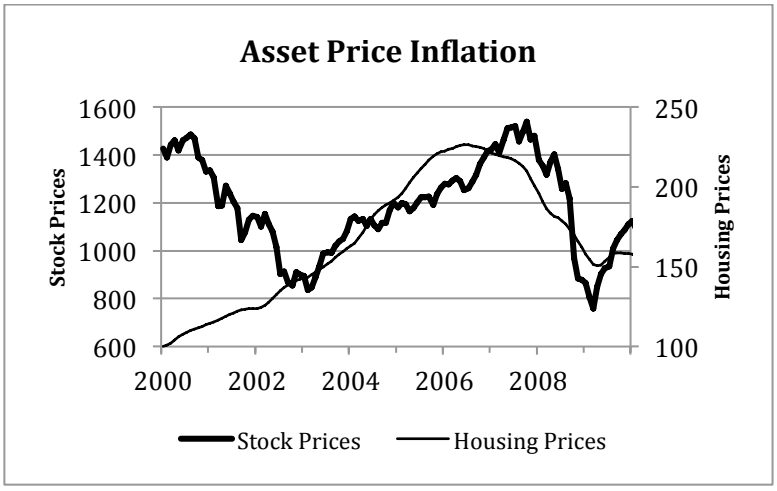
Figure 6.9 Inflation-adjusted Monetary Policy Rate, 2000-2006



Source: St. Louis Fed, FRED; Author's calculations (DFEDTAR, CPIAUCNS)

Nominal interest rates were well below the rate prescribed by the Taylor rule for an even longer period of time, around four years.[319] From 2003, the economy was experiencing robust growth. At the same time, asset prices went into a period of strong appreciation, as seen in figure 6.10.

Figure 6.10 Stock Prices and Housing Prices, 2000-2009



Source: S&P, Robert Shiller (S&P 500, Composite-10 Housing Price Index)

In line with Fed doctrines, as they had evolved into the 2000s, monetary measures were not made use of to lean against rising asset prices. Preemptive tightening was thus not considered as a means to address imbalances from building up.

[319] John B. Taylor, "Housing and Monetary Policy," *Kansas City Fed Symposium*, 2007

7. CONCLUSION

> "The best way to get out of trouble is not to get into it in the first place."[320]
>
> —Ben Bernanke (2002)

Monetary policymakers must make their decisions under a high level of uncertainty. In the words of Bernanke, Fed officials "face difficult challenges in their efforts to stabilize the economy." Not only are they uncertain about "many aspects of the workings of the economy," but also how monetary policy affects the economy and by which channels such effects take place. These problems could perhaps be labeled "model uncertainty," reflecting the imprecise knowledge among central bank decision-makers on how monetary operations impact the economy. As a result, "monetary policy will never achieve as much reduction in macroeconomic volatility as would be possible if our understanding were more complete."

Additional uncertainties arise related to the data gathering process. Monetary policymakers "are even uncertain about the current economic situation as economic data are received with a lag, are typically subject to multiple revisions, and in any case can only roughly and partially depict the underlying economic reality."[321]

The data gathering process is only one obstacle. There are at least three forms of lags confronting monetary policymakers, related to policy formulation, implementation and impact. The first one of these could be called the *recognition* lag, the time and effort it takes to gather the necessary information and interpret it before formulating policy. Then follows the *implementation* lag, the time between recognition and actual implementation. Third, and last, comes the *effectiveness* lag, the time it takes for the implemented policy to hopefully have its intended effect.[322]

To deal with these epistemic challenges, monetary policymaking can take two different routes. One direction would be to commit the central bank to a monetary rule, such as the "k percent" rule proposed by Friedman, targeting monetary aggregates; a nominal income rule, stabilizing the growth rate of nominal GDP; or an inflation target, aiming at stabilizing consumer price growth at a specific annual rate.[323]

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[320] Ben S. Bernanke, "Deflation: Making Sure 'It' Doesn't Happen Here," remarks before the National Economists Club, Washington, D.C., November 21, 2002
[321] Ben S. Bernanke, "The Great Moderation," remarks at the meeting of the Eastern Economic Association, Washington, D.C., February 20, 2004
[322] Steven Horwitz, *Microfoundations and Macroeconomics*, Routledge, 2000, p. 208
[323] Juha Kilponen and Kai Leitemo, "Model Uncertainty and Delegation: A Case for Friedman's k-percent Money Growth Rule?," *Journal of Money, Credit and Banking*, Blackwell Publishing, vol. 40, no. 2-3, 2008, pp. 547-556; Robert E. Hall and N. Gregory Mankiw, "Nominal Income Targeting,"

The other direction would be to allow for more flexibility in order to address contingencies as they arise, weighing in risks and trying to make use of good judgment. This seems to be the road taken by the Greenspan FOMC, and increasingly so, moving into the second half of the Great Moderation. In the words of the former Chairman:

> "The struggle to understand developments in the economy and financial markets since the mid-1990s has been particularly challenging for monetary policymakers. We were confronted with forces that none of us had personally experienced. Aside from the then recent experience of Japan, only history books and musty archives gave us clues to the appropriate stance for policy."[324]

Thus, FOMC policymakers saw the need to continuously revise their understanding of the economy and how monetary policy should respond to unfolding developments. Concluding remarks will seek to relate these evolving beliefs and policy practices to some of the issues raised in the introductory chapter, both to the alternative theoretical approaches outlined as well as to concerns with discretionary conduct of monetary policy.

The Evolving Greenspan Standard

Former Fed Governor Laurence Meyer has commented that while Alan Greenspan was "willing to play by the rules in normal times," he did "not hesitate to depart from them in unusual circumstances."[325] Such "unusual circumstances" would come to dominate Fed decisions from the late 1990s to the mid-2000s. Thus a specific set of doctrines and practices evolved—characterized by "risk management" and preemption.

The reasoning that went into the Fed's risk management paradigm, points to a final destination of monetary doctrines and practices as they evolved during the Greenspan era. The emphasis on observing structural and institutional changes unfolding in the U.S. as well as global economy, the awareness of forecasting errors, and the uncertainties involved in the use of textbook economic models, led the Greenspan FOMC to continuously revise its framework for conducting policy. These developments eventually led to the practice of preemptive easing and, in the end, hesitant tightening.

NBER Working Paper, no. 4439, October, 1994; Ben S. Bernanke, Thomas Laubach, Frederic Mishkin and Adam Posen, *Inflation Targeting: Lessons from the International Experience*, Princeton University Press, 1999

[324] Alan Greenspan, "Opening Remarks," *Kansas City Fed Symposium*, 2002, p. 4

[325] Laurence H. Meyer, *A Term at the Fed: An Insider's View*, HarperCollins, 2004, p. 213

The asymmetrical characteristic of FOMC decisions from 2001 onwards were not only visible in the monetary easing and accommodation from 2001 to 2004, but also in the manner in which rates were hiked from 2004 to 2006, the final years of the Greenspan Fed. It is instructive to compare these monetary practices to those of the two earlier episodes.

As recalled, in the early 1990s, rates were only gradually reduced in the face of a recession and "50-mile-per-hour headwinds." Subsequently, rates were increased preemptively when signs of robust economic growth and rising inflationary expectations arose in 1994. The reasoning behind these actions, as evidenced by statements formulated by the actors involved, was the desire to fully contain inflationary pressures and keep a lid on longer-term inflationary expectations. As argued at the time, in order to "be successful," the FOMC would have to "implement the necessary monetary policy adjustments well in advance of the potential emergence of inflationary pressures, so as to forestall their actual occurrence." The challenge facing policymakers were thus to interpret economic and financial data in order to anticipate future inflationary or contractionary forces, and counter them "by taking action in advance."[326]

In the first half of the Greenspan era, these actions centered upon preventing inflationary forces, which were not seen as fully contained. Policymakers perceived that there was still "a significant inflation premium" to be discerned from observing long-term interest rates, especially bond yields. These premiums were seen to reflect a belief among participants that monetary policy retained some inflationary bias. Thus, the inflation-fighting credentials did not seem secure; the job was "not yet complete." Moreover, the costs of bringing down high levels of inflation, especially the painful experiences of the Volcker disinflation, seemed to suggest that it was "crucial" that the FOMC did not let these inflationary forces re-emerge.[327] Thus monetary policymakers sought to strengthen their inflation-fighting credentials to convince bondholders, and the public at large, of their anti-inflationary commitments. This would seem to explain the motives behind the decisions of engaging in preemptive tightening in 1994.

In the next monetary episode, stretching from the outbreak of the Asian crisis in 1997 to the turnaround in U.S. stock markets at the beginning of the new millennium, the picture seems more mixed. The commitment to preemptive tightening in the face of perceived future inflationary pressures seemed to be maintained, by looking at statements given by historical actors. However, the policy actions point to gradual hesitation in leaning against signs of

[326] Alan Greenspan "Testimony," before the Committee on the Budget U.S. House of Representatives, June 22, 1994, p. 4
[327] Alan Greenspan "Testimony," 1994, p. 5

strong growth and what policymakers themselves perceived as "heated" labor markets. Weighing the global disinflationary forces up against the pressure stemming from domestic markets, the FOMC felt assured that "any intensification of inflation should be delayed, very gradual, and readily reversible," thus the perceived need to tighten was less pronounced than in the mid-90s. In result, "monetary policy" was largely "kept on hold."[328] Moreover, when faced with downside risks associated with distress in world financial markets, especially in the wake of the Russian default, the FOMC sought to contain potential fallout by taking out "insurance"—thus engaging in preemptive easing.

In the third episode, the FOMC initially moved somewhat hesitatingly when stock markets went into significant decline from September 2000 onwards, but once the balance of risks shifted towards a focus on downside threats stemming from financial developments and signs of weaker economic activity, rates were cut in dramatic fashion, starting in January 2001. The 9/11 terror attacks and the perceived global uncertainties that followed led policymakers to pull down money market rates to record lows, not seen in half a century, and keep them there for an extended period of time. The FOMC was by now mainly concerned with downside risks. When core inflation gradually trended down towards 1 percent in 2003, policymakers were inclined to act preemptively by easing rates from already low levels. Several economic and financial indicators pointed towards a robust recovery. However, the FOMC was concerned with "the probability, though minor, of an unwelcome substantial fall in inflation."[329]

The monetary strategy of the early 2000s was seen as successful by policymakers. In 2002, Greenspan stated:

> "The massive drop in equity wealth over the past two years, the sharp decline in capital investment, and the tragic events of September 11 might reasonably have been expected to produce an immediate severe contraction in the U.S. economy. But this did not occur. Economic imbalances in recent years apparently have been addressed more expeditiously and effectively than in the past, aided importantly by the more wide-spread availability and more intensive use of real-time information."[330]

Thus risk management and preemption seemed to give high dividend, and became a main staple of U.S. monetary doctrines.

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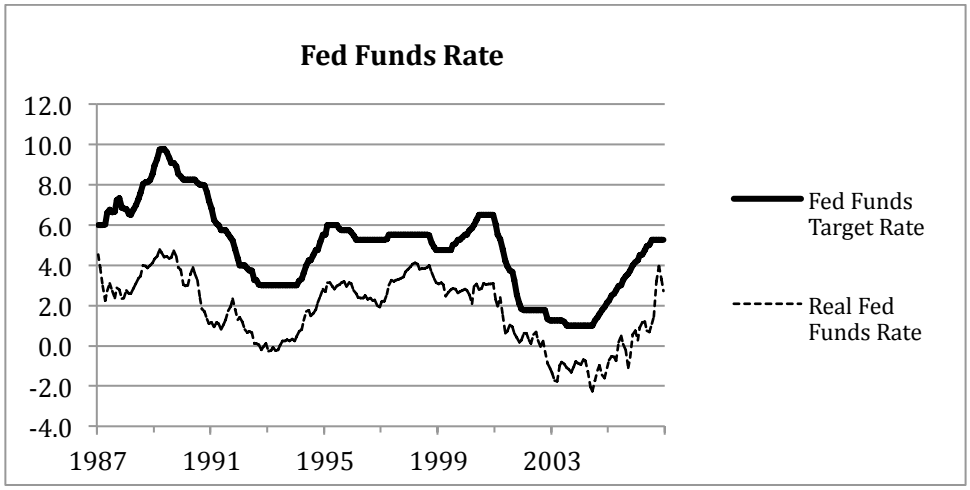
[328] Greenspan, "Statement," *Humphrey-Hawkins*, 1998 (1), p. 30
[329] *Statement*, June 25, 2003
[330] Alan Greenspan, "Opening remarks," Kansas City Fed Symposium, 2002, pp. 1-2

By comparing these three episodes, policy seems to have shifted from an asymmetrical bias towards preemptive tightening in the first half of the Greenspan era, to an opposite bias towards the end, that of preemptive easing. The movements of the fed funds rate across the Greenspan era are displayed in figure 7.1.

Figure 7.1 The Greenspan FOMC Monetary Policy Rate, 1987-2006



Source: St. Louis Fed, FRED; Author's Calculations (DFEDTAR, CPILFENS)

As an approximation, by comparing the slopes of the curve depicting the fed funds target rate, the second half of the period looks to some degree like a mirror image of the first half. From 1989 to the fall of 1992, rates were gradually reduced in the face of an ongoing recession and financial problems related to the balance sheets of banks, households and firms. Unemployment shot up, and remained elevated from 1990 to 1995, while output growth significantly decelerated in 1990, turning negative in early 1991. (See figure 6.4.) In 1994, as economic growth was on the rise and unemployment trending downwards, rates were raised relatively fast.

By contrast, in 2001, rates came down more quickly and were kept at a low level for a longer period of time. Rates were further cut to stave off potential threats in 2002 and 2003. When downside risks failed to materialize, and the economy was showing signs of robust growth, tighter labor markets and strong asset appreciation, rates were only gradually raised from mid-2004.

By comparing the real fed funds rate, the move towards preemptive easing should become even clearer. In the early 1990s, real rates were gradually brought down to zero percent and briefly kept there. In contrast, in 2001 the real rate was brought down close to zero in less than a year, then kept there for around a year, before pushed even lower, into negative ground, where it was kept for more than two years. Which underlying beliefs led

policymakers to keep the federal funds rate—nominal and real—at such low levels for such a long time?

It has been argued that beliefs were formed by lessons drawn from past monetary episodes as well as new understanding forming in response to contemporaneous challenges coming to policymakers' attention throughout this period.

Looking backwards, the defining monetary event that would shape postwar concerns with macroeconomic stabilization was the Great Contraction of 1929-1933—the initial years of the Great Depression in which the broader money supply as well as output and employment went through a rapid and severe contraction. The fear of deflation and depression gradually faded out of memory in the postwar era as policymakers were increasingly confronted with a contrary challenge, a surge in inflation leading to a protracted period of macroeconomic volatility, high unemployment and sluggish growth—the Great Inflation. Once inflation was contained, through unprecedented monetary tightening in the early 1980s and a further push towards "price stability" in the 1990s, the specter of deflation reemerged in the early 2000s.

In the wake of a severe asset bust, U.S. inflation trended downwards. Simultaneously, a post-crash Japanese economy was ailing from a mysterious malaise in which moderate deflation was associated with stagnant economic growth. Thus the events of the 1930s took on new meaning, now seen in the light of "Japanese disease," a protracted economic slowdown with deflationary pressures that apparently could impact even a modern, industrial economy with developed macroeconomic policy levers in the hands of fiscal and monetary authorities.

The preemption strategy seems to have resulted from the desire, or perceived need, to tackle what was increasingly seen as a wide range of threats that could upset the delicate balance of the Great Moderation and central bankers' hard-earned reputation as stabilizers of inflation and output volatility. In other words, the reputational capital of the Fed was at risk. A depreciation of this capital would have much wider ramifications than any base pecuniary losses. According to prevailing doctrine, the public needed to believe in the ability of central bankers, in order for the economy to function as planned. In lack of a metallic base, such as was provided by the gold standard in the early years of the Fed, the "nominal anchor" for the price level and the public's expectations of inflation now solely rested upon the credibility of the monetary authorities in stabilizing the purchasing power of the dollar or, to be more precise, the annual growth in consumer prices. The alternative could be prices and wages spinning out of control, as happened in the Great Inflation—a time monetary policy veered significantly off track and the authorities' inflation-fighting credentials were at a low ebb.

Painful measures to rein in inflation had given results—monetary excesses and a volatile economy had given way to moderate and stable inflation as well as moderate output volatility. The consensus that emerged among central bankers and their intellectual supporters within academia greatly emphasized the desirability of price stability. Initially this was interpreted as a commitment to prevent inflation from trending upwards. With the deflation scare, a downside risk to inflation was added as well.

In light of the economic imbalances that surfaced shortly after Greenspan's departure as Fed chief—starting with an incipient housing crisis in 2006, turning into a credit crunch in the fall of 2007, and finally a full-scale financial crisis in the fall of 2008—several economists and commentators increasingly started to question central aspects of the formerly shared consensus. Journalists and legislators seemed to focus in on the much-maligned "Greenspan doctrine"—the set of beliefs holding that financial innovations during the Great Moderation were mainly a stabilizing force, strengthening the overall performance of the economy. Central banking researcher John B. Taylor drew a different conclusion, putting the blame squarely on FOMC decisions diverging from his own monetary policy rule. His main contention was that monetary policy had somehow veered "off track" during the first half of the 2000s, becoming less principled.[331] Thus an important question is whether the shifts in policy focus and actions during the Greenspan years represent a move from more rule-bound authority to a larger degree of discretion, as the Taylor critique would suggest. In other words, did the conduct of monetary policy become more discretionary during Greenspan's tenure?

Preemption as Discretion

Assessing different monetary strategies, one could perhaps make a distinction between three ways of conducting policy. The first could be called "putting out fires," which seems to be a good description of policy practices in the 1970s and early 1980s. The monetary brakes were only applied once inflation seemed to spin out of control—when inflationary pressures were perceived as a more urgent matter than escalated unemployment rates. The second approach could be called "looking out the window."[332] Policy practices following such a strategy would be to tighten money whenever the real time inflation rate (or any other indicator the central bank is trying to target) exceeds the preferred level. Strict inflation targeting, as initially practiced in some industrial countries, could perhaps fit such a description.

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[331] John B. Taylor, *Getting Off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis*, Hoover Institution Press, 2009

[332] Blinder suggests the labels "putting out fires" and "looking out the window" and includes a discussion of preemption, *Central Banking*, 1999, pp. 7-17

As recalled, Donald Kohn early on took issue with such an approach and stated the desire to allow flexibility in the conduct of policy when faced with certain contingencies.[333] Thus the Fed chose a third approach, one that could be described as preemption. Such a strategy involves looking at a wide range of economic and financial indicators to get an idea of where the economy is headed and which potential threats could arise, then performing a balancing of risk, before moving to prevent such risks from materializing if they are seen as especially damaging to the economy.

In the early 1990s, this approach was used to carefully assess signs of inflation expectations trending upwards. One indicator made use of was bond yields, which could reveal the public's anticipations of future inflation as well as its beliefs on where the monetary policy rate was headed. On several occasions, the Fed attempted to manage these expectations by taking actions that would show its determined stance against letting inflationary forces re-emerge. Thus, the inflation-fighting credentials of the central bank were believed to be gradually strengthened.

In the late 1990s, a second motive appeared. Now policy aimed at preempting downside risks, as witnessed by the rate cuts in 1998. Once these risks were perceived to have subsided, policymaking turned to addressing the heated economic expansion through rate hikes in 1999-2000. However, the response to clear signs of tight labor markets and strong growth seemed less determined than in 1994, and the tightening came somewhat belatedly. Moreover, the Fed decided not to lean against the strong asset price appreciation associated with the dotcom boom.

By the early 2000s, the precautionary focus turned policymakers' attention even more strongly to addressing downside risks, as the fight to combat inflation seemed finally to have been accomplished. In 2003, Governor Ben Bernanke noted that core inflation (measures of inflation that exclude the prices of food and energy components) had reached a level in the range of 1 to 2 percent per year, which was "probably the *de facto* equivalent of price stability."[334]

In the early Greenspan years, the natural rate framework was applied consistently in assessing the economy and deliberating upon policy. This framework was gradually revised, in light of new understandings of the economy. More attention was given to managing inflation expectations by interpreting economic and financial data. From the late 1990s, a wider set of

[333] Donald L. Kohn, "Policy Targets and Operating Procedures in the 1990s," *Kansas City Fed Symposium*, 1989, p. 137
[334] Ben S. Bernanke, "An Unwelcome Fall in Inflation?," remarks before the Economics Roundtable, University of California, San Diego, La Jolla, California, July 23, 2003

concerns emerged, as a growing awareness of global developments, including disinflationary forces and potential financial disturbances from emerging markets, increasingly came to influence policymakers' understandings. Thus the epistemic burden placed upon policymakers' shoulders seems to have become increasingly heavy. The perceived need to contemplate a broader range of contingencies points to policy becoming more discretionary.

In his opening remarks at the 2003 Jackson Hole symposium on "Monetary Policy and Uncertainty," Greenspan outlined how the monetary authorities should address risks related to potential financial fallouts, concluding that a "cost-benefit analysis is an ongoing part of monetary policy decisionmaking, and tips more toward monetary ease when the fallout from a contractionary event […] seems increasingly likely and its occurrence seems especially costly."[335] He was specifically referring to actions taken to preempt the potential fallout from the Russian debacle in 1998. Likewise, in explaining the actions taken to contain the downside risk of deflation in 2003, he stated that "it is incumbent on a central bank to anticipate any contingency, however remote, if significant economic costs could be associated with that contingency."[336]

Comparing these statements to how the Fed defended its reluctance to ease in the early 1990s, when the economy was in fact experiencing the consequences of the fallout from a contractionary event, namely the S&L crisis and the balance sheet recession that followed, suggests important changes in policymakers' understandings of the economy. In the early 1990s, the FOMC was concerned with the need to "establish a basis for sustained growth." Moreover, monetary ease was seen as inappropriate in dealing "with the very real imbalances" that "needed to be resolved before sustainable growth could resume."[337]

Such a view would lean more towards the perspectives proposed by BIS economists. In contrast, in the second half of the Greenspan era, monetary easing was increasingly seen as an appropriate remedy to contain financial fallout and the threat of post-crash contractionary forces, including the threat of "corrosive" deflation. The strategy, as described by Governor Bernanke in the opening quote of this chapter, was that a precautionary principle should be followed in addressing downside risks, especially the potential of deflationary pressures arising in the wake of a substantial asset bust. However, this precautionary principle was not applied in addressing imbalances on the upside, such as strong asset appreciation and rapidly increasing debt levels among firms and households during a boom. Thus the principle of

[335] Alan Greenspan, "Opening remarks," *Kansas City Fed Symposium*, 2003, pp. 4-5
[336] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 2003 (2), p. 49
[337] Alan Greenspan, "Statement," *Humphrey-Hawkins*, 1993 (1)

preemptive tightening was not seen as appropriate to address strong asset price inflation and other signs of a heated economy unrelated to the natural rate framework.

These beliefs point to a certain understanding of the economy seen from within the perspective of price stability. As briefly discussed in the introductory chapter, this model of the economy postulates a "neutral" or "natural" rate of interest, one that tends neither to push prices up nor down. Later this idea was revised within the context of "rational expectations." If the public could form precise expectations of the growth in consumer prices, they would adjust their behavior accordingly so that no "real" effects pushed the economy away from the assumed natural rates of output and employment. However, what is missing from this conception of the economy are other forms of imbalances that can arise, related to inter-temporal dis-equilibrium stemming from interest rates falling below the natural level, seen as the rate that equilibrate (voluntary) savings and investment.

The monetary equilibrium approach, associated with this view of the interest rate, places much more weight on imbalances that arise when interest rates seize to play this important role. Specifically, money supply exceeding money demand will tend to add expansionary pressures, push down interest rates and change incentives among households, producers and investors—even when consumer price growth is stable. Productivity growth and global disinflationary forces, stemming from strong growth abroad, push down prices, thus keeping inflation in check. However, low interest rates will still affect other variables in the economy, giving rise to potential imbalances. Such concerns were not voiced among FOMC decision-makers, adhering to the overarching price stability framework for understanding policy.

The Greenspan FOMC thus put great weight on managing expectations and drawing upon the natural rate framework. However, once monetary policymakers perceived to finally have gotten a firm grip on inflation, priorities changed, addressing other threats. The formation of financial instability was seen as largely unrelated to monetary policy, other than that price stability could foster an environment encouraging speculation and in which risk was seen as less pronounced.

Greenspan seemed to take a view of financial instability not far removed from Minsky, emphasizing how "good times" in periods of stable prices and moderate output volatility can set off destabilizing speculation in asset markets.[338] However, his beliefs seem to lack

[338] "As recent experience attests, a prolonged period of price stability does help to foster economic prosperity. But, as we have also observed over recent years, as have others in times past, such a benign economic environment can induce investors to take on more risk and drive asset prices to unsustainable levels." Alan Greenspan, "Monetary Policy and the Economic Outlook," Testimony before the Joint Economic Committee, U.S. Congress, June 17, 1999

consistency in that he simultaneously put great faith in financial market participants' ability to assess risk and perform sound valuation, encapsulated in the "Greenspan doctrine." His understanding of the U.S. economy and the (potentially) stabilizing role of monetary policy could perhaps best be described as eclectic, in that his thinking seem to be torn between a Minsky view of financial market behavior, a Hayekian view of market knowledge and a Fed staff view of price stability, expectations and the "natural rate" framework. On top of this was a firm commitment to look at the facts, going through vast amounts of data and be willing to revise formerly held beliefs in the face of new evidence. As such, Greenspan's empiricism and ongoing learning process, trying to understand the transformational forces observed in the global economy in an "age of turbulence" played an important part in forming the evolving U.S. doctrines and practices of the Great Moderation.

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CPIAUCNS	Consumer Price Index for All Urban Consumers: All Items
CPILFENS	Consumer Price Index for All Urban Consumers: All Items Less Food & Energy
DFEDTAR	Federal Funds Target Rate
DTB1YR	1-Year Treasury Bill: Secondary Market Rate
FEDFUNDS	Effective Federal Funds Rate
FINSAL	Final Sales of Domestic Product
GDPC1	Real Gross Domestic Product, 1 Decimal
GS10	10-Year Treasury Constant Maturity Rate
GS30	30-Year Treasury Constant Maturity Rate
GS3M	3-Month Treasury Constant Maturity Rate
M1	M1 Money Stock, Seasonally Adjusted
M1V	Velocity of M1 Money Stock, Seasonally Adjusted
M2NS	M2 Money Stock
M2V	Velocity of M2 Money Stock, Seasonally Adjusted
PNFI	Private Nonresidential Fixed Investment, Seasonally Adjusted Annual Rate